DOCUMENT RESUME

ED 112 134 95 CE 004 920

TITLE Program and Curriculum Guide for Vocational Agriculture/Agribusiness in South Dakota.
INSTITUTION South Dakota State Div. of Vocational Education, Pierre.; South Dakota State Univ., Brookings. Dept. of Agricultural Education.
SPONS AGENCY Office of Education (DHEW), Washington, D.C.
PUB DATE [74]
NOTE 159p.

EDRS PRICE MF-$0.76 HC-$8.24 Plus Postage
DESCRIPTORS *Agribusiness; *Agricultural Education; Agricultural Occupations; Course Content; *Curriculum Guides; Information Sources; Occupational Information; Off Farm Agricultural Occupations; *Program Descriptions; Program Evaluation; Reference Materials; Resource Guides; *Vocational Agriculture

ABSTRACT

The guide is designed for use by agricultural instructors, administrators, supervisors, school boards, and others who are involved in planning instructional programs for vocational agriculture/agribusiness education in high schools and adult education. Part 1 details information pertaining to the administrative aspects of program development, management, and evaluation. It discusses content areas, supporting areas of instruction, adult education, multi-district programs, and total career education in agriculture, that will prepare individuals for job entry and upgrade their occupational training. The process of evaluating such a program is outlined in detail. Part 2, about three-fourths of the document, deals with instruction and outlines, instructional content areas, and supporting areas in agricultural production: animal science; agronomic science; agricultural business management, economics, and marketing; agricultural supplies/services; agricultural mechanics; agricultural products; ornamental horticulture; agricultural resources; supervised occupation experience; and Future Farmers of America. For each it gives a list of examples of performance objectives, occupational titles, and content outline. It also gives lengthy lists of bibliographic sources, references, and instructional aids. Suggested lists of facility and equipment specifications and a sample four year program in vocational agriculture are appended in detail. (Author/EC)

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PROGRAM AND OPPORTUNITY GUIDE FOR VOCATIONAL AGRICULTURE/AGRIBUSINESS IN SOUTH DAKOTA

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AGRICULTURAL EDUCATION
DIVISION OF EDUCATION
SOUTH DAKOTA STATE UNIVERSITY
IN COOPERATION WITH
SOUTH DAKOTA
DIVISION OF VOCATIONAL-TECHNICAL EDUCATION

FOREWORD

This Program and Curriculum Guide for Vocational Agriculture/ Agribusiness was developed under the direction of the Agricultural Education staff at South Dakota State University, in cooperation with the South Dakota Division of Vocational-Technical Education. Its development was funded through a sub-contract grant from EPDA. The interest and assistance on the part of E. B. Oleson, Director of Vocational-Technical Education, and L. A. Iverson, Supervisor, Teacher Education, Division of Vocational-Technical Education, are gratefully acknowledged.

The project grew out of a need to revise the Instructor's Guide for Teaching Vocational Agriculture in South Dakota, which was initially developed in 1950. Since that time, the total program in what currently is termed Vocational Agriculture/Agribusiness education has changed drastically, and it was felt necessary to develop a guide including two main parts. Part I, which details information pertaining to administrative aspects of program development, management, and evaluation; and Part II, which deals with instruction, including examples of performance objectives, occupational titles, content outlines, and source materials. Additional useful materials are found in the Appendix.

This guide is designed for use by instructors, administrators, supervisors, school board members, advisory council members, and others who are involved with programs of Vocational Agriculture/ Agribusiness education.

ACKNOWLEDGMENTS

Appreciation is expressed to the individuals who gave their time and knowledge to the preparation of this publication. This program and curriculum guide is the result of the pooling of knowledge and experience and much research in curriculum developments in other states, by the 14 men involved in the Curriculum Workshop held at South Dakota State University in July and August of 1974 under the leadership of Dr. H. W. Gadda, Supervisor of Teacher Education in Agriculture, South Dakota State University.

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INTRODUCTION

The Program and Curriculum Guide for Vocational Education in Agriculture/Agribusiness in South Dakota was developed for use by administrators, school boards, and agriculture instructors in planning instructional programs to meet the needs of their students.

The program of Vocational Agricultural/Agribusiness is concerned with all the people in the school area who have an interest in agriculture. A complete program provides for well planned and closely integrated action in the following areas:

1. A complete program of instruction in agriculture for high school students.
2. Day and evening school work in adult agricultural education programs.

The Vocational Agriculture/Agribusiness program provides an opportunity for the school to spread its influence in every home of the school patronage area.

Agriculture is the basic industry in the State of South Dakota. Vocational Agriculture/Agribusiness programs designed to meet the occupational needs of this industry are certainly an asset to every South Dakota community.

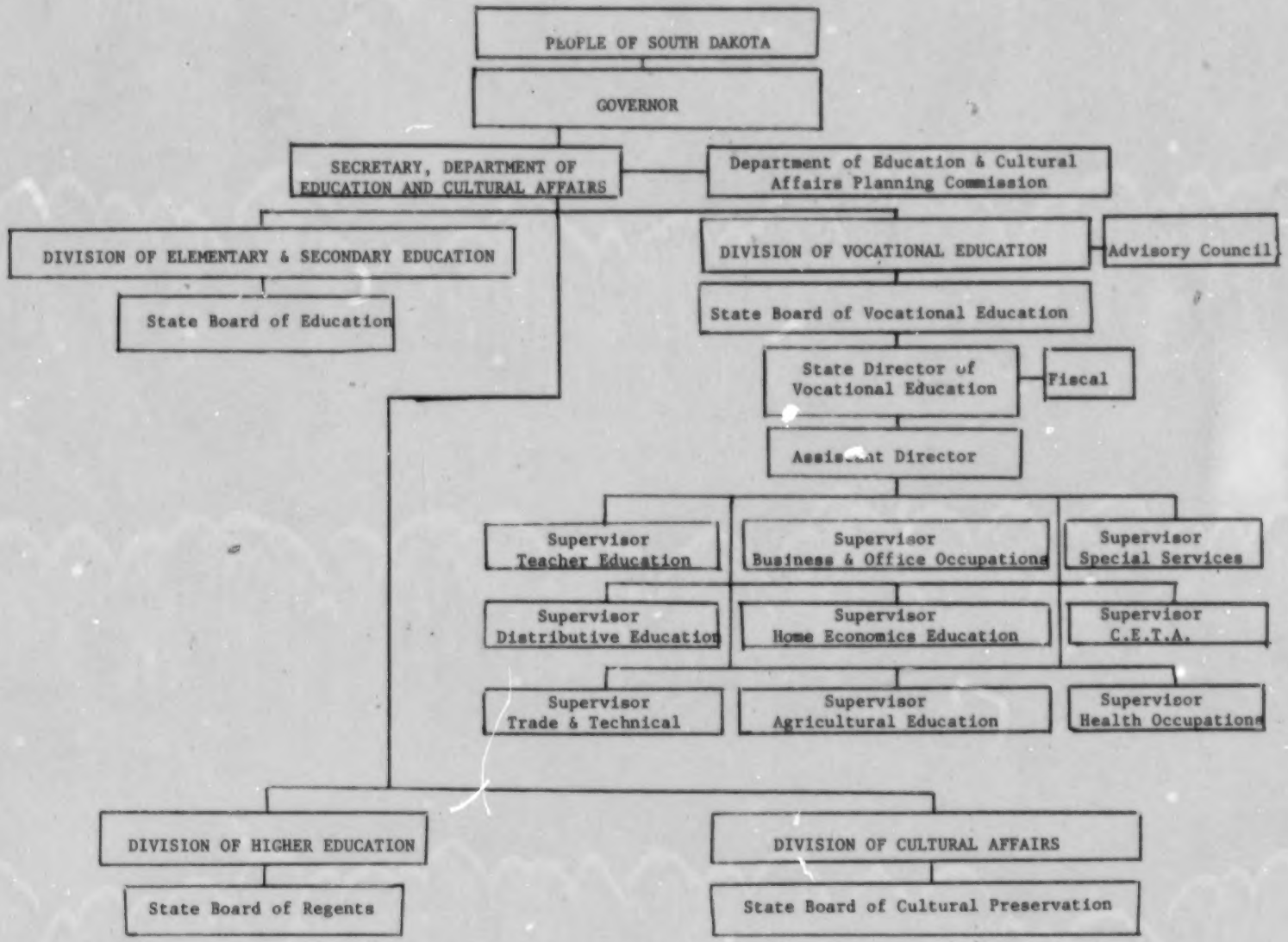
MAJOR PROGRAM OBJECTIVES FOR VOCATIONAL AND TECHNICAL EDUCATION IN AGRICULTURE

1. To develop agricultural competencies needed by individuals engaged in or preparing to engage in production agriculture.
2. To develop agricultural competencies needed by individuals engaged in or preparing to engage in agricultural occupations other than production agriculture.
3. To develop an understanding and appreciation of the career opportunities in agriculture and of the preparation needed to enter and progress in agricultural occupations.

5. To develop those human relations skills and attitudes required for success in an agricultural occupation.

6. To further develop leadership abilities and civic responsibilities.

SOUTH DAKOTA DEPARTMENT OF EDUCATION AND CULTURAL AFFAIRS



PART I

PROGRAM DEVELOPMENT, MANAGEMENT, AND EVALUATION

PROGRAM DEVELOPMENT

INAUGURATING THE VOCATIONAL AGRICULTURE/AGRIBUSINESS PROGRAM

The following steps can be used for inaugurating a Vocational Agriculture/Agribusiness program:

1. Ascertain needs for the program.
2. Promotion of program in community.
3. Invite consultant from Agricultural Education State Supervisory Staff to provide approval for a program.
4. Obtain approval from Division of Vocational Education.
5. Procure facilities, teacher(s) and enrollment.
6. Develop curriculum and course of study for the program.

SECONDARY INSTRUCTION IN AGRICULTURE

Instructional program in Vocational Agriculture/Agribusiness will prepare individuals for job entry, will upgrade occupational skills or will prepare the learner for further occupational training.

THE CONTENT AREAS OF INSTRUCTION

The Agricultural Instructional programs related to occupations as classified and coded by the U.S. Office of Education with their code are:

1. Code 01.01 Agricultural Production.
   This deals with the subject matter and learning activities concerned with all aspects of production - land, water, machinery, labor, finances, etc.
2. Code 01.02 Agricultural Supplies/Services.
   This area deals with the subject matter and learning experiences concerned with occupations included in preparing students for occupations providing consumable supplies and services used in the production phase of agriculture.
3. Code 01.03 Agricultural Mechanics.
   The subject matter and activities are designed to develop abilities in selection, operation, maintenance and use of agricultural power, machinery, equipment, buildings, etc.

4. Code 01.04 Agricultural Products.
The subject matter and learning experiences are concerned with the scientific principles and operation in the preparation of agricultural products for sale and consumption.

5. Code 01.05 Ornamental Horticulture. (Production, Processing, Marketing and Services)
The organized subject matter and practical experiences are concerned with the culture of plants used principally for ornamental or esthetic purposes.

6. Code 01.06 Agricultural Resources. (Conservation, Utilization and Services)
The subject matter and planned learning experiences are concerned with the principles and processes involved in the conservation and/or improvement of natural resources such as air, forests, soil, water, fish, plants and wildlife.

7. Code 01.07 Forestry. (Production, Processing, Management, Marketing and Services).
The subject matter and experiences are concerned with the multiple use of forest lands and resources including their management and protection.

SUPPORTING AREAS OF INSTRUCTION

A. Supervised Occupational Experience Programs

The aim of Vocational Agriculture/Agribusiness education is to prepare individuals for any agricultural occupation in which knowledge and skill in agricultural subjects is involved. Knowledge and skill in production agriculture are basic and fundamental in many agricultural occupations. A large number of Vocational Agriculture/Agribusiness students continue to develop occupational experience in a comprehensive supervised farming program. The tradition of the student "learning by doing" still continues to receive emphasis. However, changes in agricultural employment and education require a revision in the occupational experience program to include off-farm agriculture on-the-job training. These facts, along with the South Dakota state plan for vocational

education, set forth a program of both on-and off-farm agricultural occupational training.

Students completing instruction in the occupational experience program will have strengthened their interests in agricultural occupations and have developed abilities to (1) analyze the contribution of agriculture to the economy of the community, state, and nation; (2) analyze their future employment in an agricultural occupation; (3) secure employment in an agricultural occupation; and (4) have acquired the practical experience necessary for successful performance in an agricultural occupation.

B. The Future Farmers of America

The local chapter of the Future Farmers of America has become one of the best forces in the community for developing an attitude of good will, not only for the Agriculture Department but for the entire school. Membership consists of the students enrolled in Vocational Agriculture/Agribusiness at the secondary level. They may continue their active membership for three years beyond graduation from high school. There are many opportunities for developing leadership, for community service, citizenship, training, cooperation and recreation. The many activities growing out of the Future Farmers of America serve as excellent news and publicity material which can help create a good public relations attitude in the community.

ADULT EDUCATION IN AGRICULTURE

The modern school does not confine itself to purely academic training; it does not limit itself to serving youth from kindergarten through

high school; the school must be concerned with the activities of the family, community, state and the world. The State Plan for Vocational Education states that a complete program in Vocational Agriculture/Agribusiness in the secondary school includes educational activities to meet the needs of agriculturally oriented adults.

There is a need for providing a broad range of educational opportunities in agriculture for all persons beyond the secondary level who are interested in and who will benefit from them. Courses for adults shall be designed to provide knowledge and help them gain proficiency in agricultural practices.

MULTI-DISTRICT PROGRAMS IN AGRICULTURE

The multi-district concept for Vocational Education in South Dakota is making vocational training available to many high school students who previously did not have that opportunity. Students from several school school districts are bussed to a vocational training center for two hours a day, while remaining enrolled in their home school for basic required courses. By pooling resources, training is made available in specialized areas which can not be offered to a limited number of students on the local level due to the high cost of equipment and facilities.

A school day is divided into three blocks of time - typically 8:30 to 10:15; 10:15 to 12:00 and 1:15 to 3:00. Students from the central school make up all of Block I due to the fact that the outlying schools must take time to be transported to the Career Center.

Vocational Agriculture/Agribusiness can be offered to many students who otherwise would not have this opportunity. It does present some special problems in that in many areas strong four year programs in

in Vocational Agriculture/Agribusiness are already being offered on a four year grade level of 9-12. It is not recommended that this program be discontinued in favor of a one year, or at best, two year program of Vocational Agriculture/Agribusiness in a Career Center.

There are at least three kinds of situations to be considered for offering Vocational Agriculture/Agribusiness in a Multi-District Career Center.

First, if no Vocational Agriculture/Agribusiness training is offered in the area the ideal plan is a two year program enrolling up to 120 students and being staffed by two teachers. This will allow for growth in occupational training and supervised farming programs for at least two years. Leadership training opportunities are much greater and the curriculum offered can be as broad as a full four-year course.

If approximately sixty students can be enrolled (twenty per class) it is still possible to cover quite a broad curriculum by rotating the course offerings every other year under one teacher.

If a one year curriculum is offered the opportunities for growth in supervised farming are very limited and the time for development and participation in leadership and FFA activities is also limited. It becomes a nine months program.

When there are one or more four year programs in Vocational Agriculture/Agribusiness within the Multi-district area it is recommended that they continue to operate and that those schools who do not have departments make up the Career Center departments. This requires special consideration when it comes to financing, organization and scheduling. Each district must study its own situation as to how best to accomplish this.

A third alternative is to offer specialized training in areas not presently being offered by existing Vocational Agriculture/Agribusiness departments to supplement existing programs and yet offer training to those students who have had no training.

TOTAL CAREER EDUCATION IN AGRICULTURE

A basic purpose of American Education is the preparation of people for a living and preparation of people for a career. Career Education is the development of attitudes and appreciations toward workers and the benefits each worker receives and gives as a contributing member of society. Career Education can be the focal point for developing an educational awareness of the use of skills and knowledge taught in the schools and used by adults in the working world. Career Education can be the center of the curriculum which joins school, family, and community into a joint effort of educating the young. Career Education is concerned with the total development of a student. This means providing experiences for students to conceptualize the career development concepts which should be introduced to pre-schoolers and developed through high school.

Career development, which is a lifelong process, begins at a very early age when the child role plays various occupations in his play. The child goes through the following stages:

The Awareness Stage, which covers the period through grade six, is a period when the child not only becomes aware of himself and other people physically, emotionally and socially, but he also gains intellectual skills and knowledge.

The Exploration Stage, which usually covers the middle or junior high school level, is a time for some actual exploring of a variety of occupations. It is a time of self-assessment and of consideration of the various types of careers available to the individual.

A tentative decision may be made by grade nine in order to begin the Preparation Stage. This Stage will last as long as necessary for the acquisition of skills and knowledge needed to enter and progress through one's occupational career.

The vocational education phase of career education begins when the student has made at least a tentative career choice. In other words, the vocational education component of career education provides specialized preparation for the student's chosen occupation. The Vocational Agriculture/Agribusiness teacher should provide leadership or assistance in implementing the total career education concept regarding agriculture in the school.

Career Education, then, is the education of a child of today in a manner which will make his life useful and productive in the world he will live in tomorrow.

PROGRAM MANAGEMENT

The operation of a Vocational Agriculture/Agribusiness department is a complex, dynamic undertaking and success will not be attained by chance.

The basic difference between a Vocational Agriculture/Agribusiness instructor and a non-vocational instructor is that the Vocational Agriculture/Agribusiness instructor is responsible for a complete program, whereas the non-vocational instructor is responsible for teaching classes.

One attribute a Vocational Agriculture/Agribusiness instructor must have is that of being able to plan his work, suitably put his plan into operation and finally evaluate his executed plans.

In this publication an effort is made to briefly outline the management of a total program.

PROVIDING AND USING FACILITIES, EQUIPMENT, SUPPLIES AND TEACHER AIDS

Each school will provide the facilities needed for an adequate instructional program. These needs will vary according to the number of students, the type of instruction to be followed, and the number and kind of agricultural occupations in which training is being given.

The State Supervisor of Agricultural Education has developed a guideline set of recommendations and requirements concerning facilities, equipment, supplies and teaching aids (See Appendix A and B). The consultant services of the Division of Vocational Education are available for assisting communities in determining their needs. An example of government regulated equipment is included on the next page.

FORTY-FOURTH SESSION OF THE LEGISLATURE OF THE

STATE OF SOUTH DAKOTA

Chapter 61 (H.B. 607)

REQUIRING PROTECTIVE EYE DEVICES FOR PUPILS AND TEACHERS IN CERTAIN COURSES OF INSTRUCTION

AN ACT Entitled, An Act to require certain elementary and secondary schools within the state to supply protective eye devices to pupils and teachers participating in certain courses and to require pupils and teachers desiring protective-corrective eye devices to secure such devices at their own expense.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF SOUTH DAKOTA:

Section 1. Every pupil and teacher in any elementary or secondary school with this state, public, private, or parochial, participating in any of the following:

(a) Vocational or industrial arts shops or laboratories involving use of or exposure to: (1) hot metals; (2) milling, sawing, turning, shaping, cutting, or stamping of any solid materials; (3) heat treating, tempering, or kiln firing of any kind of any metal or other materials; (4) gas or electric arc welding; (5) repair or servicing of any vehicle; (6) caustic or explosive materials;

(b) Chemical or combined chemical physical laboratories involving caustic or explosive chemical or hot liquids or solids;

is required to wear industrial quality eye protective devices at all times while observing or engaging in any such activities. The school board of each such public school district and the appropriate school administrators of such parochial or private schools shall purchase and cause such industrial quality protective eye devices to be placed in such public, parochial, or private schools for the eye protection of pupils, teachers and visitors to such classrooms or laboratories.

Section 2. Any person desiring industrial quality eye protective devices other than those supplied by the school board or administrators shall at his own expense procure and equip himself with such industrial quality eye protective devices.

Section 3. "Industrial quality eye protective devices," as used in this Act means devices meeting the standards of the USA Standard Practice of Occupational and Educational Eye and Face Protection, Z87.1-1968, and subsequent revisions thereof, approved by the United States of America Standards Institute, Incorporated.

Approved March 13, 1969.

TIME ALLOCATION FOR CLASS PREPARATION, TEACHING, SUPERVISION, AND PROGRAM MANAGEMENT

It is important to emphasize the fact that the teaching activities of an agriculture instructor carry him far beyond the walls of the classroom in the performance of his duties. This fact has a special significance in calculating the teaching load of agriculture instructors. Some of the factors having a bearing on the teaching load of the agriculture instructor and the personnel needed to conduct a complete program are:

1. The size and scope of high school agricultural programs, including classroom instruction, FFA program of work, and supervised occupational experience program.
2. The scope of the adult education program.
3. School-community coordination and service activities. Specifically, vocational agriculture is concerned with:
   a. secondary school youth
   b. out of school youth
   c. adults who need training to make entry into agricultural employment or upgrade their occupational performance.

The local school should feel an obligation to train for the whole agricultural industry and not just for production agriculture. It is the role of the Vocational Agriculture/Agribusiness department in the community, in addition to its function in rural education, to serve those people of the community in the business phase of agriculture.

LOCAL POLICIES FOR OPERATION OF COOPERATIVE OCCUPATIONAL EXPERIENCE PROGRAMS

An important part of the Vocational Agriculture/Agribusiness program is the occupational experience programs carried on by the students. Examples of occupational experience programs would be

livestock and farming projects carried out on the student's home farm, placement for farm experience, and placement for off-farm agriculture related training.

Under the Vocational Education Act of 1963 and amendments of 1968, training for off-farm agricultural occupations has become an important part of the Vocational Agriculture/Agribusiness program. This work is designed for students who are interested in agriculture and have received training in Vocational Agriculture/Agribusiness work. (It is recommended that two years of regular Vocational Agriculture/Agribusiness course work precede this training so that the students will be equipped to participate in these related occupations.) A minimum of 300 hours of on-the-job training in the occupational field is considered essential for proper training. The work experience will be secured through the cooperation of various agricultural businesses in the community and their related course work will be conducted by the Vocational Agriculture/Agribusiness instructor and such consultants as may be used under the direction of the Vocational Agriculture/Agribusiness instructor.

It is important that the experience program be established in such a way that the student is participating in a well-planned, coordinated, and educational program that will benefit the student in his study of the field of agriculture. The instructor participates in this process through related classroom instruction and on-farm or on-job supervision of the students activities.

Additional information on off-farm programs can be found in the publication "Guidelines for Establishing Off-Farm Agricultural Experience Programs in Vocational Agriculture in South Dakota."

ORGANIZING AND CONDUCTING ADULT EDUCATION IN AGRICULTURE

The local Vocational Agriculture/Agribusiness instructor upon determining the needs of the local community or individuals in that community should establish a program of adult education to meet these needs.

Presently, three methods of instruction are commonly used. One method in the individualized program of farm management. This method involves instructor participation with farm families in maintaining an Adult Farm Business Management program and in providing advice in making management decisions. The second method involves instruction in farm mechanics and the third, instruction in areas of productive enterprises. In many cases the second and third areas may be combined to meet local needs.

It is important that the Vocational Agriculture/Agribusiness instructor develop an organized, comprehensive program and that the use of outside personnel as speakers/instructors be held to a minimum.

PARTICIPATION IN LEADERSHIP OF THE AGRICULTURAL COMMUNITY

The Vocational Agriculture/Agribusiness instructor occupies a unique position of leadership in his community. As the director of the agricultural education program for high school and adults operating throughout the calendar year, rather than the traditional nine-month academic year, he has an unusual opportunity for effective community leadership. The very nature of the curriculum requires that he carry his instruction on to the farms and in cooperation with the agricultural business firms of his high school area. This affords him the opportunity to put the school-community philosophy into action. He can very

effectively function as a coordinator of rural and urban relations. No other faculty member has as advantageous a position of serving the whole community and of securing the complete cooperation of students, parents, farmers, businessmen, and community organizations as has an effective teacher of Vocational Agriculture/Agribusiness. If his department is to flourish he cannot afford to be less than a full-time citizen of the community, taking part in school and community activities and organizations. As soon as possible he must become well acquainted with farm people, local business people, and various organizations of business and farm people. He might serve on the agricultural committee of the local Chamber of Commerce or he may become active in a service club.

The Vocational Agriculture/Agribusiness instructor's role as a teacher, counselor, and advisor to farm people, old and young, makes his work of connecting the farm, the school, and the city an adventure in community building.

DETERMINING COMMUNITY AND INDIVIDUAL NEEDS

The dependence on close working relationships between home and school and between parents, teacher, and student is a unique characteristic of agricultural education. All those responsible for program development in agriculture at the community level - school administrators, teachers, supervisors, teacher educators, school board members, and those serving on advisory councils - take cognizance of the basic need for coordination of all available resources.

A significant responsibility of a Vocational Agriculture/Agribusiness instructor is the community survey. It involves the identification of all farm and non-farm agricultural occupations and

businesses in the school service area. It can be assumed that, until the personnel of a Vocational Agriculture/Agribusiness department have made personal contact with the people involved in the agricultural businesses and occupations in a community, the insights and understanding of community needs in agricultural education are incomplete.

The community survey provides a picture of the human and physical resources that make up the complex of South Dakota's agricultural industry.

KEEPING DEPARTMENTAL RECORDS AND MAKING REPORTS

The nature of the Vocational Agriculture/Agribusiness program in relation to state funding requires the submission of reports to the State Office of Vocational Education. The State Supervisor will provide each department with the required report forms. It is the responsibility of the Vocational Agriculture/Agribusiness instructor to insure the accurate and timely submission of reports to the State Office. This will insure the proper reimbursement to the school district and help the State Office to more adequately provide for the Vocational Agriculture/Agribusiness programs of the state.

PROFESSIONALISM AND PERSONAL RELATIONSHIPS WITHIN THE SCHOOL AND COMMUNITY

The Vocational Agriculture/Agribusiness instructor himself is the most important factor in the development of an effective program in the community. His personality, integrity, and judgment, his unselfish devotion to his responsibility, and his ability to get along with people are essential in developing and maintaining the standards of education in agriculture.

The Vocational Agriculture/Agribusiness instructor must recognize his role as a member of the local staff as well as exhibiting high ethical standards in the community. Indeed a continued effort to attain more formal and informal training in agriculture through attendance at in-service workshops, college classes, field days, reading agricultural publications and writing for publication is vital to the educational and professional growth of the progressive Vocational Agriculture/Agribusiness instructor.

Active participation in local, state, and national professional organizations is also suggested for the instructor.

THE SUMMER PROGRAM

Because of the nature of the Vocational Agriculture/Agribusiness program it is recommended that the instructor be hired on a 12 month basis. The summer months are of extreme value to a truly vocational program in agriculture. Most of the work in production agriculture is done during the summer months, therefore, it is only natural that the summer months be an opportune time to make supervisory visits that are a part of the total program. The summer months also offer an opportunity for the instructor to organize course content and purchase needed materials for the next school year. Because of the broad nature of the field of agriculture, it is important that the instructor continually strive to stay abreast of new developments. The summer months offer excellent opportunities to do this.

It is important that the Vocational Agriculture/Agribusiness instructor visit prospective students of Vocational Agriculture/Agribusiness, to explain the program offerings to the student and his or

her parents, so that they understand the aims and purposes of the Vocational Agriculture/Agribusiness program, and are able to make wise decisions concerning their education for the future.

The summer period also provides opportunity to conduct related instruction and occupational experience in off-farm agricultural occupations.

It is the responsibility of the Vocational Agriculture/Agribusiness instructor to keep the school administration and Board of Education informed as to his plans and accomplishments during the summer months.

It is suggested that the instructor furnish the school administration with a schedule of planned activities for the coming week and a follow-up list of accomplishments during the week.

LOCATING SOURCES OF PROGRAM MATERIALS AND INSTRUCTIONAL AIDS

The numbers of educational materials available to the Vocational Agriculture/Agribusiness instructor are almost limitless. Source materials are cited at the end of each part of Part II. An instructor searching for specific materials should contact the State Agricultural Education Office, the Teacher Training Department for Agriculture at the State University, the Agricultural Extension Service, or commercial concerns involved in the specific area for which material is being sought.

The local instructor should insure that his source material is available well in advance of the time it will actually be used.

MANAGING A MULTIPLE TEACHER DEPARTMENT

Much time is required in visiting students placed for occupational training in a Cooperative Off-Farm Agriculture Occupations program and

Supervised Farming program. Similarly, a Farm Management program in adult education is centered around on-farm instruction with the individual farm couples. Because the nature of instruction in Vocational Agriculture/Agribusiness is different in many ways from that of most other courses taught in South Dakota secondary schools, it is apparent that the traditional method of calculating teacher load by including only regularly enrolled high school students violates the community-school philosophy and is a handicap to a truly functional educational program.

When determining the teaching load of the Vocational Agriculture/Agribusiness instructor, consideration should be given to the type of instruction carried out in the local Vocational Agriculture/Agribusiness department. As a suggested guideline, it is recommended that a Vocational Agriculture/Agribusiness department with more than 65 students be considered a teaching load of sufficient nature to require two Vocational Agriculture/Agribusiness instructors.

In hiring and managing personnel for a multiple teacher Vocational Agriculture/Agribusiness department, it is recommended that the school consider the strengths of each instructor, and assign the teaching load in such a manner that the talents of each instructor be used to maximum advantage in strengthening the Vocational Agriculture/Agribusiness department.

It is recommended that in a multiple teacher department, a structure be recognized whereby one individual is recognized as the department head.

TIME ALLOCATION TO SUBJECT MATTER AREAS

It is the responsibility of the local Vocational Agriculture/Agribusiness instructor to develop a time plan which allocates adequate time for teaching within the various content areas of his local program.

Some example time plans appear in the appendix of this publication.

A PLANNED PUBLIC RELATIONS PROGRAM

Public relations begin as soon as the local high school hires a Vocational Agriculture/Agribusiness instructor. The everyday activities and the program of the Vocational Agriculture/Agribusiness instructor, to a large degree, are his public relations program, since the future of the department depends to a large degree on the image of his program in that community. It is the job of the teacher to so motivate his students that, by their enthusiasm for the program, they become a public relations medium.

Another step might be to make use of various methods by which the public can become informed as to what the program is, what its purposes and services are, and the people for whom it is designed.

Local newspapers, radio, TV, window displays, and public appearances or the program of local groups are all means of telling the story of the agriculture industry and the Vocational Agriculture/Agribusiness program. The many activities growing out of the FFA serve as excellent news and publicity material.

It is recommended that the instructor develop a planned public relations calendar for his program.

COMPETITIVE ACTIVITIES

The educational use of contests, awards and other motivational

activities is recognized as an integral part of the Vocational Agriculture/Agribusiness program. The local instructor should attempt to use these available opportunities in such a manner so as to promote the interest of the students in the Vocational Agriculture/Agribusiness program. When used correctly the activities can serve to enhance the learning on the part of the students and promote the effectiveness of the classroom instructor.

EVALUATION

PHILOSOPHY OF EVALUATION

Evaluation of a Vocational Agriculture/Agribusiness is a vital ingredient to ensure its success, and should be structured and implemented on a regular schedule. Evaluation is the collection of supportive evidence for future program directions and program improvement.

(A) Management by Objectives

Management by objectives consists of establishing major program goals, student performance objectives and selecting suitable criteria for measuring success of program goals and performance objectives.

(B) True Accountability

Accountability is a highly structured approach to measuring the achievement of specific program objectives. Steps to implementation include: (1) Performance criteria related to the Vocational Agriculture/Agribusiness program must be established. (2) An impartial judgment focused on degree of success of each performance criterion must be obtained and (3) a public report of the findings must be submitted to those involved with the program.

(C) Process vs. Product Evaluation

Evaluation of Vocational Agriculture/Agribusiness programs must involve both process and product evaluation. Process evaluation involves the effective utilization of the following inputs: teacher salary, equipment, facilities, curriculum, teaching methods, teaching materials, text references and supplies. Product evaluation consists of collecting evidence to substantiate the student outcomes of those receiving the benefits of the program. Examples of evidence suitable for product evaluation are: percent graduates employed, percent graduates employed in on-farm and off-farm agriculture, and competencies and skills possessed by students who were receptive to the learning process.

(D) Evaluation vs. Accreditation

Evaluation is the preferred method for judging degree of success and future program direction at the local Vocational Agriculture/Agribusiness program level. Accreditation of South Dakota Vocational Agriculture/Agribusiness programs has historically been associated with North Central Association Accreditation for Secondary Schools. When a high school with a Vocational Agriculture/Agribusiness program is visited by a North Central accreditation team the Vocational Agriculture/Agribusiness program is to be considered as an integral part of the total high school accreditation process.

WHEN TO EVALUATE AND WHO SHOULD PARTICIPATE

Evaluation should be an on-going effort. Appraisal of effectiveness of teaching, teaching materials, curriculum and other elements should be done as the teaching learning process is conducted. However, a more concerted effort should be concentrated once annually in the interest of total program evaluation. The consummation of this effort should be in the form of a report to the administration and board of education on the program conducted during the year, its activities and progress. The time of doing this each year can be determined locally.

Those affected by the program and who are or will be the beneficiaries of the results of evaluation should be involved in the evaluation process. Such persons include the teacher, students, administrators, school board members, employers, advisory council members, parents, and state supervisory and teacher education staff members. Follow-up studies of former students should involve those who have been out of school for a long enough period of time to allow for their establishment in an occupation.

SELF-EVALUATION

Self-evaluation implies that local people assess the effectiveness of local programs. This is in contrast to the procedure in which outside evaluators come in to appraise the local program. Since the outcomes of self-evaluation have far-reaching educational values locally, this approach is the preferable one. It includes studying the local program of Vocational Agriculture/Agribusiness in terms of its philosophy and objectives, needs, clientele served, facilities, competencies developed, organization, curriculum and other measures of adequacy and effectiveness.

EVALUATION OF STUDENT LEARNING

Evaluation for determining the degree of student learning and degree of competency possessed can be accomplished by pencil and paper tests and student performance testing. A total evaluation of student learning must include not only testing within the school, but also the collecting of evidence demonstrating the utilization of skills and competencies possessed as related to the student's supervised occupational experience program.

EVALUATION CRITERIA AND INSTRUMENTS

The following is a suggested list of criteria used in evaluating a Vocational Agriculture/Agribusiness department. This list could include but not limited to:

A. Program Objectives
B. Curriculum
C. Equipment

D. Facilities
E. FFA Program
F. Role of the Advisory Council
G. Compentencies Possessed (student)
H. Follow-up of Former Students

Techniques to accomplish the above could be the following:

A. Interviews
   1. Students
   2. Adults in Production Agriculture
   3. Adults employed in Off-Farm Agribusiness
   4. Administration
   5. Employers
B. Reports and Documentations (copies of State Vocational Agricultural reports, FFA scrapbook, etc.)
C. Questionnaires

Suggested program evaluation instruments are found in the appendix.

SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAM

To evaluate a Supervised Occupational Experience program (on-farm and off-farm) the following criteria should be used:

1. All students are involved in either on-farm or off-farm experience.
2. Curriculum for related instruction.
3. Written training plans.
4. Written training agreements.
5. Earnings.
6. Utilization of efficiency factors.
7. Extent of approved practices used.
8. Extent of supplementary practices used.
9. Extent of improvement projects completed.
10. Role of advisory council.
11. Instructor supervision records & extent of supervision.
12. Completeness of record keeping system.
13. Percent of records completed.
14. Student progress toward occupational goals.
15. Placement and follow-up of students.

MECHANIZED AGRICULTURE

To evaluate an Agricultural Mechanics program the following list of criteria should be used:

A. Facilities
B. Equipment
C. Safety standards
D. Curriculum
E. Degree of skill development

EVALUATION OF FFA ACTIVITIES

The evaluation of FFA activities should properly consist of the extent of and completeness of the local chapter program of activities. An essential ingredient of the local chapter program of activities would include opportunities for each student to develop potential leadership abilities.

The evaluation would best be conducted by determining the extent of and scope of activities as reported in the National Chapter Award Program. This form can be found in the Chapter Guide to FFA Activities booklet.

ADULT PROGRAMS

The following evaluation criteria should be used when evaluating an Adult program:

A. Objectives
B. Number of meetings
C. Average attendance
D. Curriculum
E. Farm record and analysis completed
F. Role of the Advisory council
G. Planning
H. Follow-up

EVALUATING FACILITIES

The facilities typically used in South Dakota programs of Vocational Agriculture/Agribusiness education include a classroom, agricultural mechanics laboratory, and office-conference room. In some cases a separate laboratory is provided for such instruction as soil testing, seed testing, etc.

In evaluating the classroom part of the facility, points to include are: size, arrangement, storage, equipment, lighting, heating, ventilation, decor, water supply, washing facilities, locker space, safety aspects, restrooms, and housekeeping. The office-conference room should be evaluated on its size, location, adequacy of view, arrangement, equipment, heating, lighting, ventilation, decor and housekeeping.

Standards for facilities evaluation are available from the office of the state supervisor of Agricultural Education and from Agricultural Education teacher training departments in South Dakota and other states.

It is desirable to have an instructional laboratory adjacent to the Vocational Agriculture/Agribusiness classroom. The laboratory is utilized to allow students to perform tasks and allow the Vocational Agricultural/Agribusiness instructors to perform demonstrations that

normally could not be conducted in the regular classroom due to the necessity of water and sewer facilities. It also provides an excellent overflow room to enhance multiple student activities to occur at a given time. Suggested criteria include: size, arrangement, storage, safety aspects and housekeeping.

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27. Vocational Agriculture Department Evaluation (State Supervisor Form) Division of Vocational Education, Pierre, South Dakota

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PART II

INSTRUCTION

INSTRUCTIONAL CONTENT AREAS

1. Agricultural Production (01.01)

Example Performance Objectives:

1. Given an item to be depreciated and sufficient financial information the student will be able to set up a depreciation schedule and correctly calculate depreciation by two depreciation methods.

2. Given a list of feeds, including homegrown and commercial, the cost of each and a given species of livestock the student will be able to design a least-cost balanced ration that is appropriate for the animal's weight, sex, age and productive purpose.

3. When given a grain sample containing weed seeds, the student will correctly identify the primary noxious weed seeds to the satisfaction of the instructor.

Occupational Titles - Animal Science

Instructional programs based upon content in this guide will prepare individuals for job entry, will upgrade occupational skills, or will prepare learners for further occupational preparation.

General Occupations

Farmer
Veterinarian (large animal)
Farmhand
Livestock Herdsman
Livestock Auctioneer
Livestock Breeder
Production Researcher
Nutrition Researcher
Meat Science Researcher
Nutritional Physiologist
Livestock Farmer
Veterinarian's Assistant
Livestock Farmhand
Animal Science Teacher
Livestock Caretaker
Extension Service Livestock Specialist
Breeding Researcher
Muscle Biology Researcher
Livestock Geneticist
Reproduction Researcher
Artificial Insemination Technician
Vocational/Agricultural Instructor

Horse Occupations

Horse Herdsman
Horse Farmhand
Horse Trainer
Barn Boss
Farrier
Horse Breeder
Horse Stableboy
Horse Teacher

Poultry Occupations

Egg Poultryman
Poultry Debeaker
Poultry Teacher
Turkey Breeder
Poultry Farmhand
Poultry Breeding Researcher
Poultry Products Technologist
Meat Poultryman
Chicken Sexer
Chicken Breeder
Poultry Farmer
Poultry Geneticist
Poultry Nutrition Researcher

Beef Occupations

Beef Farmer
Beef Herdsman
Beef Teacher
Beef Breeder
Stock Ranch Foreman
Cattle Feeder
Beef Farmhand
Cowboy
Feedlot Foreman
Feedlot Maintenanceman
Cattle Rancher

Dairy Occupations

Dairy Teacher
Dairy Farmhand
Dairy Breeder
Dairy Farmer
Dairy Herdsman
Milking Machine Operator

Sheep Occupations

Sheep Farmer
Sheep Farmhand
Wool Shearer
Sheep Herdsman
Sheep Teacher
Sheep Breeder

Swine Occupations

Swine Breeder
Swine Herdsman
Swine Teacher
Swine Farmer
Swine Farmhand

Content Outline:

ANIMAL SCIENCE

I. Livestock Industry

A. The importance of livestock to the economy

B. Occupational opportunities

II. Animal Nutrition

A. Base fundamentals of animal nutrition

B. Feed nutrients

C. Digestion

D. Feed additives

E. Formulating and balancing rations

III. Animal Breeding

A. Genetics

B. Reproductive system

C. Breeding systems

D. Methods of breeding

IV. Beef Cattle

A. Selection of breeding stock

B. Feeding and managing the breeding herd

C. Feeding and managing calves

D. Selection of feeder cattle

E. Feeding and managing feeder cattle

F. Control of diseases and parasites

G. Housing and equipment for beef cattle

H. Record keeping and analysis

I. Marketing beef cattle

V. Dairy Cattle

A. Selection of breeding stock

B. Feeding and management of producing herd

C. Feeding and management of calves

D. Control of diseases and parasites

E. Housing and equipment

F. Marketing

G. Record keeping and analysis

VI. Horses

A. Principles of horse selection

B. Caring for brood mare and foal

C. Feeding horses

D. Horse health

E. Basic horsemanship

F. Housing and equipment

VII. Poultry

A. The poultry industry

B. Selecting chicks and birds for production

C. Feeding and managing the laying flock

D. Feeding and managing young chickens

E. Turkey production and management

F. Marketing

G. Control of diseases and parasites

VIII. Sheep

A. Selection of breeding sheep

B. Feeding and management of breeding flock

C. Feeding and management of feeder lambs

D. Control of diseases and parasites

E. Housing and equipment

F. Marketing

G. Record keeping and analysis

IX. Swine

A. Selection of breeding and feeding stock

B. Feeding and management during breeding

C. Feeding and management during gestation

D. Feeding and management during farrowing and lactation

E. Feeding and management from weaning to market

F. Control of diseases and parasites

G. Housing and equipment

H. Marketing

I. Record keeping and analysis

Suggested Source Materials:

Bulletins:

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7. HOW TO BUY POULTRY BY USDA GRADES, MB 1, USDA.
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42. DAIRY EQUIPMENT PLANS, MWPS 7, Midwest Plan Service.
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SOURCES FOR REFERENCES AND INSTRUCTIONAL AIDS

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   Montgomery, Alabama 36100

2. Albers Milling Company
   800 West 47th Street
   Kansas City, Missouri 64112

3. American Hereford Association
   Public Relations Department
   Hereford Drive
   Kansas City, Missouri 64105

4. American Meat Institute
   59 East Van Buren Street
   Chicago, Illinois 60600

5. The American Quarterhorse Association
   P.O. Box 200
   Amarillo, Texas 79105

6. American Sheep Producer's Council
   200 Clayton Street
   Denver, Colorado 80202

7. American Society of Agriculture Engineers
   St. Joseph, Michigan 49085

8. American Society of Animal Science
   425 Illinois Building
   113 North Neil Street
   Champaign, Illinois 61820

9. A. O. Smith Harvestore Products, Inc.
   550 West Algonquin Road
   Arlington Heights, Illinois 60005

10. Armour and Company
Public Relations Department
P.O. Box 9222
Chicago, Illinois 60690

11. Bureau of the Census
Department of Commerce
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

12. Chief of Division of Animal Industries
State House
Des Moines, Iowa 50319

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U.S. Department of Labor
Superintendent of Documents
U.S. Government Printing Office
Public Documents Department
Washington, D.C. 20402

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Eli Lilly and Company
Indianapolis, Indiana 46200

15. Gehl Bros. Manufacturing Co.
West Bend, Wisconsin 53095

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Agricultural Building Products Division
Granite City, Illinois 62040

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Fort Atkinson, Wisconsin 53538

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Extension Department
Brattleboro, Vermont 05301

19. Indiana State University
Vocational Resources Center
Department of Vocational Technical Education
Terre Haute, Indiana 47809

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1927 North Jackson Street
Danville, Illinois 61832

21. Iowa State University
Cooperative Extension Service
Public Distribution Center
Printing and Publishing Building
Ames, Iowa 50010

22. Iowa State University
Media Resources Center
Pearson Hall
Ames, Iowa 50010

23. IAVIM Center
Attention: Thomas A. Hoerner
Agricultural Engineering Department
Iowa State University
Ames, Iowa 50010

24. Iowa State University Press
Press Building
Ames, Iowa 50010

25. John Deere
201 South Jefferson
St. Louis, Missouri 63103

26. Land O' Lakes Felco
2827-8th Avenue South
Fort Dodge, Iowa 50501

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600 Washington Square
Philadelphia, Pennsylvania 19106

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Manchester Road
Manchester, Missouri 63011

29. Michigan State University
Cooperative Extension Service
East Lansing, Michigan 48823

30. Midwest Breeders Cooperative
Shawano, Wisconsin 54166

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Agricultural Engineering Building
Ames, Iowa 50010

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1212 Avenue of the Americas
New York, New York 10036

33. Morrison Publishing Company
515 Woodlands Drive
Clinton, Iowa 52732

34. National Academy of Science
Printing and Publishing Office
2101 Constitution Avenue
Washington, D.C. 20418

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Grundy Center, Iowa 50638

36. National Livestock and Meat Board
36 South Wabash Avenue
Chicago, Illinois 60604

37. National Pork Producers Council
4715 Grand Avenue
Des Moines, Iowa 50312

38. Ohio State University
Extension Office of Information
2120 Fyffe Road
Columbus, Ohio 43210

39. Ohio State Univeristy
Instructional Materials Service
Department of Agricultural Education
2120 Fyffe Road
Columbus, Ohio 43210

40. Oklahoma State University
Curriculum and Instructional Materials Center
Stillwater, Oklahoma 74074

41. Pennsylvania State University
Department of Agriculture Education
University Park, Pennsylvania 16802

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Educational Book Division
Englewood Cliffs, New Jersey 07632

43. Public Relations Department
Indiana Farm Bureau Cooperative Association, Inc.
47 South Pennsylvania Street
Indianapolis, Indiana 46209

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Agricultural Publications
A. E. S. Building
Lafayette, Indiana 47907

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Checkerboard Square
St. Louis, Missouri 63199

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United States Government Printing Office
Washington, D.C. 20402

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College Station, Texas 78712

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Sales Product Manager
322 South Michigan Avenue
Chicago, Illinois 60604

49. TUCO
Division of Upjohn
Agricultural Division
Department 9510
Building 190-1
Kalamazoo, Michigan 49001

50. Union Pacific Railroad
1416 Dodge Street
Omaha, Nebraska 68102

51. University of Illinois
Cooperative Extension Service
Urbana, Illinois 61801

52. University of Illinois
Department of Agricultural Engineering
Urbana, Illinois 61801

53. University of Illinois
Vocational Agricultural Service
434 Mumford Hall
Urbana, Illinois 61801

54. University of Kentucky
Cooperative Extension Service
Lexington, Kentucky 40500

55. University of Kentucky
Department of Vocational Education
Lexington, Kentucky 40500

56. University of Minnesota
Agricultural Education Department
St. Paul, Minnesota 55100

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Instructional Materials Laboratory
8 Industrial Education Building
Columbia, Missouri 65201

58. University of Wisconsin
Cooperative Extension Service
College of Agriculture
Madison, Wisconsin 53715

59. Vocational Education Productions
California Polytechnic State University
San Luis Obispo, California 93401

60. Wallace's Farmer
1912 Grand Avenue
Des Moines, Iowa 50305

61. Webb Publishing Company
1999 Shepard Road
St. Paul, Minnesota 55116

62. Windsor Publications
2550 Crawford
Evanston, Illinois 60201

63. Wisconsin Department of Public Instruction
Bureau of Career and Manpower Development
Madison, Wisconsin 53702

64. Bulletin Room
Extension Building
South Dakota State University
Brookings, South Dakota 57006

Occupational Titles - Custom Farm Operator

Instructional programs based upon content in this guide will prepare individuals for job entry, will upgrade occupational skills, or will prepare the learner for further occupational preparation.

Cash Grain Farmer
Custom Farm Operator
Experimental Farm Manager
Certified Seed Producer
Fertilizer or Lime Applicator
Spray Equipment Operator
Harvesting Supervisor
Pilot - Pest Control Applicator
Farmhand
Farm Loan Assistant
Farm Record Specialist
Farm Manager
Abstractor
Hail Insurance Adjustor
Farm Realtor
PCA Manager
Farm Supply Salesman
Grain Buyer
Hay and Forage Buyer
Produce Department Manager
Chemical Salesman or Fieldman
Grain Products Salesman
Farm Fuel Supplier
Food Processing Company Employee
Fertilizer Dealer or Fieldman
Fertilizer Plant Employee
Fieldman, Food Processing Company
Packing Shed Foreman
Grain Inspector
Seed Inspector
Research Technician
Weed Control Assistant
Seed Production Manager
Weed Inspector
Truck Driver - Grain and Supplies
Feed Mill Employee
Elevator Manager
Elevator Employee
Certified Seed Field Inspector
Farm Machinery Dealer
Farm Machinery Salesman or Mechanic
Farm Equipment Fabricator
Farm Equipment Research Technician
Agricultural Engineer
Farm Machinery Company District Manager
Grain Dryer Operator
Soil Conservation Aide (Technician)
Pilot-Soil Mapping
Soil Conservationist
Soil Scientist
Park Naturalist
Park Employee

Advertising Firm Manager
Market Research Analyst
Extension Director
Extension Crops or Soils Specialist
Pathologist
Entomologist
Botanist
Vocational Agriculture Instructor
Agricultural Journalist
Agricultural Broadcaster
Auctioneer
Commodity Broker
Seed Processing Foreman
Drainage Contractor
Soil Mapper
Soil Test Lab Employee
Wildlife Conservation Officer
College Professor
Peace Corps Volunteer
County Assessor
Plant Breeder
Agricultural Missionary
Farm Newspaper Editor
Foreign Agricultural Service Employee
Agricultural Economist

Content Outline:

PLANT SCIENCE

I. Opportunities

A. Economic values

B. Employment

II. Soils

A. Formation

B. Classification

C. Properties (physical & chemical)

D. Testing

E. Nutrients

F. Conservation and land use

G. Fertilization and fertilizers

III. Plant Growth

A. Plant types

B. Germination and emergence

C. Propagation and improvement

D. Life processes (photosynthesis, respiration, transpiration, assimilation and digestion)

IV. Weeds and weed control

A. Identification

B. Control (cultural & chemical)

C. Classification

V. Small Grains (oats, wheat, barley, rye, flax) Production

A. Uses

B. Types

C. Seedbed preparation

D. Planting

E. Seed selection and varieties

F. Weed control

G. Fertilizer application

H. Insects and diseases

I. Harvesting

J. Storage

K. Marketing

L. Production efficiency

VI. Corn Production

A. Uses

B. Seed selection

C. Planting

D. Weed control

E. Fertilizer application

F. Insects and diseases

G. Harvesting

H. Storage

I. Marketing

J. Production efficiency

VII. Soybean Production

A. Uses

B. Varieties

C. Seedbed preparation

D. Planting

E. Weed control

F. Insects & diseases

G. Harvesting

H. Storage

I. Marketing

J. Production efficiency

VIII. Forage Production

A. Opportunities

B. Variety identification and selection

C. Tillage and planting

D. Renovation practices

E. Carrying capacity

F. Weed control

G. Insects and diseases

H. Fertility

I. Harvesting

J. Storing

K. Marketing

L. Production efficiency

IX. Horticultural Crops

A. Fruits

B. Garden vegetables

X. Specialized crops (potatoes, sunflowers, sugar beets, certified seed production, edible beans, etc.) Use same outline format as corn.
(See S. D. Seed Certification Notebook)

Suggested Source Materials:

Bulletins:

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4. FARMERS AND AGRICULTURE IN OUR ECONOMY, Illinois VAS.
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18. EXPERIMENTS IN SOIL SCIENCE, #147-1, California VEP.
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31. IOWA'S NEW CONSERVANCY DISTRICTS AND SOIL LOSS LIMIT REGULATIONS.
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35. TESTING SOIL FOR PHOSPHORUS, 1969, Illinois VAS.
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37. THE FERTILIZER HANDBOOK, Fertilizer Institute or Farmland.
38. FERTILIZER SAFETY GUIDE, Fertilizer Institute.
39. ANHYDROUS AMMONIA SAFETY, Fertilizer Institute.
40. WHAT IS FERTILIZER? Fertilizer Institute.
41. PLANNING THE NITROGEN PROGRAM, 4009a, Illinois VAS.
42. FERTILIZER FARMACY FILE, Farmland.
43. FERTILIZER FARM MANUAL, 1969, Standard Oil.
44. FERTILIZER SUGGESTIONS FOR CORN YIELDS ABOVE 125 BUSHEL PER ACRE, #ST-5, ISU Extension.
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63. PROFITABLE CORN PRODUCTION, PM 409, ISU Extension.
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73. GROWTH AND NUTRIENT UPTAKE BY CORN, PM 277, ISU Extension.
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83. ECONOMIC CONSIDERATIONS IN CHOOSING A CORN HARVEST METHOD, AERR 13, Illinois Extension.
84. HARVESTING CORN WITH COMBINES, Illinois Agric. Engineering Dept.
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89. PLANT DISEASES (EAR CORN ROTS), #305, Illinois Extension.
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94. THREE NEW AND BETTER LARGE-SEEDED SOYBEANS, FS 1221, ISU Extension.
95. ANOTHER LOOK AT INOCULATION, FS 1274, ISU Extension.
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   Harvestore Products, Inc.
   550 W. Algonquin Road
   Arlington Heights, Illinois 60005

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10. Chevron Chemical Company
    200 Bush Street
    San Francisco, California 94102

11. CIBA-Geigy
P.O. Box 11422
Greensboro, North Carolina 27409

12. Corn Refiners Association, Inc.
1001 Connecticut Avenue, N. W.
Washington, D. C. 20036

13. DeKalb Agricultural Research, Inc.
Sycamore Road
DeKalb, Illinois 60115

14. Des Moines Register and Tribune
715 Locust Street
Des Moines, Iowa 50304

15. Doane Agricultural Services
8900 Manchester Road
St. Louis, Missouri 63144

16. Elanco Products
Eli Lilly and Company
Indianapolis, Indiana 46206

17. Farmland Industries
P.O. Box 7305
Kansas City, Missouri 64116

18. Farm Quarterly
22 East 12th Street
Cincinnati, Ohio 54210

19. Fertilizer Institute
1015 18th Street, N. W.
Washington, D.C. 20202

20. Fertilizer Solutions
910 Lehmann Building
Peoria, Illinois 61602

21. Future Farmer Supply Service
P.O. Box 15159
Alexandria, Virginia 22309

22. F & W Publishing Corporation
22 East 12th Street
Cincinnati, Ohio 45210

23. Government Printing Office
Northwest Regional Education Laboratory
500 Lindsay Building
710 West Second Avenue
Portland, Oregon 97205

24. Hoards Dairyman
Fort Atkinson, Wisconsin 53538

25. Holt, Rinehart and Winston, Inc.
383 Madison Avenue
New York, New York 10017

26. Illinois Crop Improvement Association
508 South Broadway Street
Urbana, Illinois 61801

27. Illinois, University of
Agricultural Engineering Department
Urbana, Illinois 61801

28. Illinois, University of
Cooperative Extension Service
Urbana, Illinois 61801

29. Illinois, University of
Extension Entomology
Urbana, Illinois 61801

30. Illinois, University of
Vocational Agriculture Service
434 Mumford Hall
Urbana, Illinois 61801

31. Interstate Printers and Publishers
Danville, Illinois 61832

32. Iowa Crop Improvement Association
112 Agronomy Building
Ames, Iowa 50010

33. Iowa Department of Agriculture
Federal Building, Room 855
210 Walnut Street
Des Moines, Iowa 50309

34. Iowa Department of Public Instr.
Career Education Division
Grimes State Office Building
Des Moines, Iowa 50319

35. Iowa Development Commission
250 Jewett Building
Des Moines, Iowa 50309

36. Iowa Soil Conservation Service
832 Federal Building
Des Moines, Iowa 50309

37. Iowa State University
Agronomy Club
112 Agronomy Building
Ames, Iowa 50010

38. Iowa State University
Cooperative Extension Service
Ames, Iowa 50010

39. Iowa State University
Media Resources Center
212 Pearson Hall
Ames, Iowa 50010

40. Iowa State University
University Press
Press Building
Ames, Iowa 50010

41. John Deere Film Library
C/O Modern Talking Pictures
2323 New Hyde Park Road
New Hyde Park, L. I., New York 11041

42. John Deere
The Furrow
1400 3rd Avenue
Moline, Illinois 61265

43. Kent Feeds, Inc.
Muscatine, Iowa 52761

44. McGraw-Hill
Princeton Road
Hightstown, New Jersey 08520

45. Macmillan Company
New York, New York 10011

46. Manufacturing Chemists Assoc., Inc.
1825 Connecticut Avenue, N. W.
Washington, D.C. 20006

47. Maryland State Department of Public Instruction
Department of Vocational-Technical Education
P.O. Box 8718
Friendship International Airport
Baltimore, Maryland 21240

48. Minnesota, University of
Minnesota Extension Service
Minneapolis, Minnesota 55455

49. Missouri, University of
State Department of Education
Columbia, Missouri 65201

50. Missouri, University of
Instructional Materials Laboratory
Department of Practical Arts & Vo-Tech Ed.
Columbia, Missouri 65201

51. Modern Talking Pictures, Inc.
Cedar Rapids, Iowa 52406

52. NASCO, Inc.
Fort Atkinson, Wisconsin 53538

53. National Plant Food Institute
1700 K Street, N. W.
Washington, D.C. 20006

54. New Holland Machine Company
Division of Speery Rand Corp.
New Holland, Pennsylvania 17557

55. Ohio State University
Department of Agricultural Ed.
2120 Fyffe Road
Columbus, Ohio 43210

56. Ohio State University
Cooperative Extension Service
Columbus, Ohio 43201

57. Oklahoma State Department of Instr.
Vocational and Technical Education
Stillwater, Oklahoma 74074

58. PAG Division
W. R. Grace and Company
Aurora, Illinois 60507

59. Pennsylvania State University
Department of Agricultural Educ.
102 Armsby
University Park, Pennsylvania 16802

60. Potash Institute
1649 Tullie Circle, N. E.
Atlanta, Georgia 30329

61. Prentice-Hall, Inc.
Englewood Cliffs, New Jersey 07632

62. Quaker Oats Company
Donald J. Schrickel, Manager
Grain Development
Chicago, Illinois 60601

63. Standard Oil Division
American Oil Company
Farm and Home Department
P.O. Box 4040
St. Paul, Minnesota 55116

64. Sterling Movies Production
43 West 61st Street
New York, New York 10023

65. Stipes Agricultural List
Stipes Publishing Company
10-12 Chester Street
Champaign, Illinois 61820

66. Successful Farming
Reader Service
1716 Locust Street
Des Moines, Iowa 50303

67. Texas A & M University
Texas Instruction Services
F.E. Box 182
College Station, Texas 77843

68. 3 M Company
Educational Services
Box 3100
St. Paul, Minnesota 55101

69. Office of Information
U.S.D.A.
Washington, D.C. 20250

70. Venard Organization
Peoria, Illinois 61601

71. Vocational Education Media Center
Clemson University
Clemson, South Carolina 29631

72. Vocational Education Productions (VEP)
California State Polytechnic College
San Luis Obispo, California 93401

73. Wallaces Farmer
1912 Grand Avenue
Des Moines, Iowa 50305

74. Weeds, Trees, and Turf
9800 Detroit Avenue
Cleveland, Ohio 44102

75. Wisconsin Department of Public Instruction
126 Langdon Street
Madison, Wisconsin 53702

76. Bulletin Room
Extension Building
South Dakota State University
Brookings, South Dakota 57006

Content Outline

AG BUSINESS MANAGEMENT, ECONOMICS AND MARKETING

I. Occupational Opportunities

II. Farm Business Goals

III. Records and Records Analysis

A. Importance of Records

B. Depreciation

C. Inventory

IV. Tax Management

A. Tax computation

B. Social Security Computation

V. Credit and money management

VI. Estate Planning

VII. Farm Business Organization

VIII. Land Acquisition

IX. Budgeting

X. Farm Organizations

XI. Marketing

A. Marketing methods

B. Exports and Imports

XII. Economic Principles

XIII. Government and other agencies

A. Farm Programs

B. Commodity Organizations

XIV. Insurance

XV. Agricultural Mathematics

XVI. Agricultural Law

Suggested Source Materials

Bulletins:

1. MECHANICS OF FARM FINANCIAL PLANNING, Circular 1042; University of Illinois.
2. TEACHER'S GUIDE TO FARM MONEY MANAGEMENT, 1972; Ohio State University.
3. DETERMINING CREDIT NEEDS ON THE FARM, 2025a; Illinois Vo-Ag Service.
4. PLANNING FOR REPAYMENT OF LOANS, 2026a; Illinois Vo-Ag Service.
5. SOURCES OF FARM CREDIT, 2027a; Illinois Vo-Ag Service.
6. USING CREDIT TO INCREASE FARM EARNINGS, 2024a; Illinois Vo-Ag Service.
7. COOPERATIVES IN BUSINESS, USDA.
8. HOW TO START A COOPERATIVE, USDA.
9. MEASURING COOP DIRECTORS, USDA.
10. WHAT ARE COOPERATIVES? USDA.
11. FARMER COOPERATIVES...FARM BUSINESS TOOLS, USDA.
12. WAYS FARMERS DO BUSINESS, USDA.
13. THE FARM CORPORATION, PM 273; Iowa State University.
14. CAPITALISM, SOCIALISM, COMMUNISM, 2038; Illinois Vo-Ag Service.
15. TOWARDS A LONG-RANGE SOLUTION TO THE COMMERCIAL FARM PROGRAM, FS-1155; Iowa State University.
16. OUR CAPACITY TO PRODUCE, FS-1264; Iowa State University.
17. WHICH FARM PROGRAM TO CONTROL OUR OVERCAPACITY, FS-1269; Iowa State University.
18. FARM POLICIES AND OUR RURAL COMMUNITIES, FS-1335; Iowa State University.
19. AMOUNT AND COSTS OF ALTERNATIVE LAND RETIREMENT PROGRAMS, FS-1372; Iowa State University.
20. FARM PROGRAMS, PRICE SUPPORTS AND IOWA FARMS, FS-1376; Iowa State University.
21. WHAT BARGAINING POWER FOR FARMERS, FS921; Iowa State University.
22. WHAT FARM EXPORTS MEAN TO THE UPPER MIDWEST, PM 342; Iowa State University.
23. MARKETING AGRICULTURAL PRODUCTS, 2016a; Illinois Vo-Ag Service.
24. HOW PRICES OF MEAT ANIMALS ARE ESTABLISHED, 2032; Illinois Vo-Ag Service.

25. TRENDS IN LIVESTOCK BUILDING, FS-1066; Iowa State University.
26. FACTORS INFLUENCING FARM FIELD COSTS, FS1198; Iowa State University.
27. LEASING VS OWNING, FS1371; Iowa State University.
28. CUSTOM RATES PAID, PM521; Iowa State University.
29. FITTING MACHINERY AND EQUIPMENT TO THE FARM, 2039; Illinois Vo-Ag Service.
30. FARM LABOR PAY PACKAGES, FS1373; Iowa State University.
31. PROBLEMS OF HIRING AND KEEPING FULL-TIME FARM EMPLOYEES, FS1380; Iowa State University.
32. KEEPING FULL-TIME FARM EMPLOYEES, FS1380; Iowa State University.
33. BALANCING THE LABOR SUPPLY AND THE FARM BUSINESS, 2035; Illinois Vo-Ag Service.
34. CASH WAGES AND PREREQUISITES RECEIVED, SB 438; USDA.
35. FARM LABOR INPUTS, SB438; USDA.
36. THE PARADOX OF FARM LABOR, FS1364; Iowa State University.
37. FARMER'S TAX GUIDE, INTERNAL REVENUE SERVICE NO. 225; Understanding Taxes, Student Farm Edition, IRS No 22; Teachers Guide, IRS No. 19.
38. FARM MANAGEMENT MANUAL, Standard Oil.
39. FARM BUSINESS PLANNING AND ANALYSIS FILING SYSTEM, 1971; Ohio State University.
40. APPRAISING FARM BUILDINGS, 3017a; Illinois Vo-Ag Service.
41. SOCIAL SECURITY AMENDMENTS - IMPORTANCE TO FARM AND RURAL PEOPLE, Economic Research Service No. 257; USDA.
42. TIPS FOR TEACHING HEALTH INSURANCE AND LIFE INSURANCE, Educational Division; Institute of Life Insurance.
43. WHAT SHOULD MY INSURANCE COVER, No. 231; Pennsylvania State University.
44. INSURANCE IN THE FARM BUSINESS, No. 1003; New York State College of Agriculture.
45. PLANNING FARM PROPERTY TRANSFERS WITHIN FAMILIES IN IOWA, P125; (Revised 1966) Iowa State University.
46. ESTATE PLANNING, Rev, September 1972; University of Illinois.
47. TEACHING UNITS IN LEGAL ASPECTS OF FARM BUSINESS MANAGEMENT, Purdue Univeristy.
48. USING FARM REAL ESTATE LOANS, 2033; Illinois Vo-Ag Service.
49. Bulletin Catalog "Publications off the Press," Agriculture and Home Economics, Cooperative Extension Service, SDSU.

Books:

1. AN INTRODUCTION TO AGRICULTURAL BUSINESS AND INDUSTRY, Weyant, Hoover, and McClay 1971; Interstate.
2. HANDBOOK OF AGRICULTURAL OCCUPATIONS, Hoover, 1969; Interstate.
3. CAREERS IN AGRI-BUSINESS AND INDUSTRY, Stone, 1971; Interstate.
4. DOANES DIGEST, Doanes Agricultural Service.
5. PLANNING MACHINERY PROTECTION, No. 402; AAVIM.
6. PRINCIPLES OF FARM ACCOUNTING AND BUSINESS ANALYSIS, Sidney James, 1970; Iowa State University.
7. FARM RECORDS AND ACCOUNTING, Hopkins and Heady, 5th Edition; Iowa State University.
8. FARM APPRAISAL, Murray, 1969; Iowa State University.
9. FREDDIE COMPUTER, Iowa Farm Bureau.

10. BETTER FARM ACCOUNTING, Howell, 1972; Iowa State University.
11. MACHINES FOR POWER FARMING, Stone and Gulvin, 1967; John Wiley & Sons, Inc.
12. FARM POWER AND MACHINERY MANAGEMENT, Hunt, Sixth Edition; Iowa State University.
13. FINANCIAL MANAGEMENT IN AGRICULTURE, Hopkin, Barry & Baker, 1973; Interstate.
14. EXPERIENCE PROGRAMS FOR LEARNING VOCATIONS IN AGRICULTURE, Binkley and Hammonds, 1970; Interstate.
15. FARM ESTATE & BUSINESS PLANNING, Harl, 1973; Agri-Business Publications.

SOURCES OF REFERENCES AND INSTRUCTIONAL AIDS

1. AAVIM
   Engineering Center
   Athens, Georgia 30602

2. Agri-Business Publications
   1920 Waukegan Road
   Glenview, Illinois 60025

3. Doanes Agricultural Service, Inc.
   8900 Manchester Road
   St. Louis, Missouri 63144

4. Farm Credit Banks of St. Paul
   St. Paul, Minnesota 55101

5. Felco Land-O-Lakes
   Ft. Dodge, Iowa 50501

6. Farm Credit Banks of Omaha
   Omaha, Nebraska

7. Illinois Vo-Ag Service
   College of Agriculture
   University of Illinois
   434 Mumford Hall
   Urbana, Illinois 61801

8. Institute of Life Insurance
   277 Park Avenue
   New York, New York 10017

9. Aberdeen District Office
   Internal Revenue Service
   P.O. Box 370
   Aberdeen, South Dakota 57401

10. Iowa Beef Producers (Cattleman's) Association
    Airport Road
    Ames, Iowa 50010

11. Iowa Dairy Association
Ankeny, Iowa 50021

12. Iowa Farm Bureau
5400 University Avenue
West Des Moines, Iowa 50265

13. Iowa State University
Media Resources Center
121 Pearson Hall
Ames, Iowa 50010

Publications Distribution Center
Printing and Publications Building
Ames, Iowa 50010

IAVIM Center
Attention: Thomas A. Hoerner
Agricultural Engineering Department
Iowa State University
Ames, Iowa 50010

ISU Press
Ames, Iowa 50010

14. Iowa Poultry Association
535 East Lincoln Way
Ames, Iowa 50010

15. Iowa Turkey Federation
535 East Lincoln Way
Ames, Iowa 50010

16. John Wiley & Sons, Inc.
605 Third Avenue
New York, New York 10016

17. Kentucky, University of
Lexington, Kentucky 40506

18. Montana State University
Bozeman, Montana 59715

19. NASCO
Fort Atkinson, Wisconsin 53538

20. Nebraska, University of
Lincoln, Nebraska 68508

21. New York State College of Agriculture
Ithica, New York 14850

22. Ohio State University
Curriculum Materials Service
Room 201
2120 Fyffe Road
Columbus, Ohio 43210

23. Pennsylvania State University
Department of Agricultural Education
University Park, Pennsylvania 16802

24. Pork Producers Association
4715 Grand Avenue
Des Moines, Iowa 50312

25. Purdue University
Layfayette, Indiana 47907

26. American Soybean Association
Hudson, Iowa 50643

27. Standard Oil Division
American Oil Company
Farm and Home Department
P.O. Box 4040
St. Paul, Minnesota 55116

28. Successful Farming
Meredith Publishers
1716 Locust Street
Des Moines, Iowa 50309

29. United States Department of Agriculture
Publications Division
Office of Information
Washington, D.C. 20250

30. U.S. Department of Health, Education and Welfare
Washington, D.C. 20202

31. Vocational Education Productions
California Polytechnic State University
San Luis Obispo, California 93401

32. Bulletin Room
Extension Building
South Dakota State University
Brookings, South Dakota 57006

2. Agricultural Supplies/Services (01.02)

Example Performance Objectives:

1. When given a specific job in which the student is interested, the student will be able to list, with complete accuracy and completeness, the competencies and requirements needed by persons to enter and advance in that career in agricultural supplies and services.

2. When presented a problem requiring the application of fertilizer supplied nutrients, the student will be able to list at least three sources, with 100 per cent accuracy, which will supply the required nutrients.

3. When provided information regarding the weed problem to be controlled by the use of chemicals, the student will correctly ascertain the appropriate chemicals to be used and calculate the correct amount needed, in accordance with the chemical company's recommendations.

Occupational Titles

Instructional programs based upon content in this guide will prepare individuals for job entry, will upgrade occupational skills, or will prepare the learner for further occupational preparation.

Farm Supply Center Manager
Farm Supply Production Manager
Farm Supply Sales Manager
Farm Supply Service Manager
Farm Supply Office Manager
Farm Supply Company Research and Development Director
Farm Supply Company Fieldman
Farm Supply Center Bookkeeper
Farm Supply Salesman
Farm Supply Serviceman
Farm Supply Applicator
Farm Supply Equipment Operator
Farm Supply Warehouseman
Farm Supply Center Deliveryman
Farm Supply Center Sales Clerk
Farm Supply Center Stock Clerk
Feed Mill Employee
Petroleum and Related Products Route Salesman
Agricultural Chemical Fieldman
Farm Supply Center Worker
Parts Man
Grain Elevator Man
Grain Grader
Grain Inspector
Feed Specialist
Seed Technician
Animal Health Supply Salesman
Veterinarian's Assistant
Pest Exterminator
Pest Exterminator Supervisor
Weed Inspector
Grain Hauling Contractor
Grain Hauler
Custom Pesticide Applicator
Farm Supply Order Clerk
Farm Supply District Salesman
Pet Center Sales Clerk
Warehouse Foreman
Public Relations Specialist
Route Salesman

(Farm supplies include feed, fertilizer, chemicals, seeds, animal health products, petroleum and related products, hardward, lumber, and farm machinery and other equipment.)

Content Outline

I. Orientation to off-farm Agribusiness Occupations

A. Occupational Opportunities

B. Competencies Needed

C. Securing a Job

D. Occupational Experience and Related Instruction

II. Organization and Operation of Agriculture Business and Industry

A. Community Needs

B. Business Organization
(Ways of doing business)

C. Business Operation and Management

1. Credit
2. Purchasing
3. Records
4. Depreciation
5. Insurance
6. Personnel Management
7. Taxes
8. Others

D. Government Regulations

1. Safety
2. Employment Security
3. Consumer Protection
4. Other

III. Ag Math

A. Calculating and writing sales orders

B. Calculating % markup, selling price, and profit.

C. Determining %, amount, and cost of rations, fertilizers, chemicals and seeds.

D. Determine amount and cost of building supplies.

E. Computing interest

F. Calculate storage capacities

G. Calculate land areas

H. Figuring costs of production

IV. Human Relations and Personality Traits

A. Dealing with Co-Workers

B. Dealing with Employer or Supervisor

C. Dealing with the Public

D. Desirable Personality Traits

E. Communications Skills

V. Merchandising Skills

A. Knowledge of Merchandise

B. Inventory Procedures

C. Merchandise display, advertising, storage, and handling

D. Operation of in-store equipment

E. Housekeeping and security

F. Business Accounting

VI. Salesmanship and Selling

A. Understanding the customer

B. Attributes of a sales person

C. Product knowledge in the selling process

D. Locating prospective customers

E. Steps in making the sale

F. Evaluation of selling procedures

VII. Feeds (01.02.02)

A. Utilization of Feeds and Feedstuffs by Livestock and Poultry

B. Providing Nutrients for Livestock and Poultry

C. Formulating Feed Mixture

D. Preparing Feeds in the Feed Mill

E. Pick Up and Delivery

F. Warehousing Feed

G. Regulations in Formulating and Labeling Feed

VIII. Fertilizers (01.02.04)

A. Formulations of Fertilizers

B. Utilization of Fertilizers and Lime Materials

C. Determining Fertilizer and Lime Needs

D. Applying Fertilizer

E. Handling and Storing Fertilizers

IX. Seeds (01.02.03)

A. Quality Control Regulations in the Seed Industry.

B. Making Seed Recommendations

C. Seed Processing

D. Storage and Handling of Seeds

E. Quality Seed Production

X. Chemicals (01.02.01)

A. Utilizing Chemicals for Agricultural Problems

B. Preparing Chemical Solutions for Agricultural Purposes

C. Applying Agricultural Chemicals

D. Observing Safety Precautions in Handling Agricultural Chemicals

E. Bulk Storage

XI. Animal Health and Care (01.02.99)

A. Nature and Causes of Diseases

B. Feed and Exercise Requirements

C. Sanitation Practices

D. Feeding Practices

E. Drug Handling and Care

F. Surgical Instruments and Terminology

G. Animal Anatomy and Psysiology

H. Post Mortems

I. Procedures in Animal Health and Care

XII. Grain and Livestock Marketing (01.04.01)

(See Section on Agricultural Products)

Suggested Source Materials

Bulletins:

1. OPPORTUNITIES IN AGRICULTURAL OCCUPATIONS AND THE EMPLOYEE WITHIN THE BUSINESS ORGANIZATION, 1971; Ohio State University.
2. OPPORTUNITIES IN SUPPLIES AND SERVICE AND IN PRODUCTION, Agriculture Kit; University of Illinois.
3. AGRICULTURAL JOB CLASSIFICATIONS; University of Missouri.
4. PLANNING FOR A CAREER IN AGRICULTURE, Student Handbook and Teacher's Guide; Pennsylvania State University.
5. APPLYING FOR A JOB, VAS 6001; University of Illinois.
6. DECIDING ON AND LOCATING YOUR KIND OF JOB, 1971; Ohio State University.
7. GETTING YOUR JOB, 1971; Ohio State University.
8. AGRICULTURE IS MORE THAN FARMING; The Future Farmers' Supply Service.
9. THERE'S A FUTURE IN YOUR FARM BACKGROUND; The National Sales Executives, Inc.
10. YOUR FARM BACKGROUND AND AGRI-BUSINESS SELLING; Sales and Marketing Executive International.
11. IMPROVING HUMAN RELATIONS; National Association of Manufacturers.
12. HUMAN RELATIONS IN BUSINESS, 1971; Ohio State University.
13. HUMAN RELATIONS IN AGRICULTURAL BUSINESS, VAS 6003; University of Illinois.
14. HUMAN RELATIONS IN AGRICULTURAL OCCUPATIONS; Iowa State University
15. SALESMANSHIP IN AGRICULTURAL OCCUPATIONS; Iowa State University.
16. BUSINESS PROCEDURES IN AGRICULTURAL OCCUPATIONS; Iowa State University.
17. SELLING AND SALESMANSHIP; Ohio State University.
18. SALESMANSHIP IN AGRICULTURAL BUSINESS, VAS 6003; University of Illinois.
19. STUDENT STUDY GUIDE ON SALESMANSHIP AND SELLING; University of Kentucky.
20. THE BASIC STEPS IN SELLING; Pennsylvania State University.
21. SMOOTH SELLING SALES TRAINING COURSE, 152 Pamphlets on Selling; George N. Kohn Company.
22. OFFICE PROCEDURES USED IN THE AGRICULTURAL SERVICES, 1973; Ohio State University.
23. MARKETING AGRICULTURAL PRODUCTS; Ohio State University.
24. BUSINESS PRACTICES FOR AGRICULTURAL MACHINERY DEALERS, 1969; Ohio State University.
25. STUDENT STUDY GUIDE ON STORE SKILLS; University of Kentucky.
26. THE USE OF THE CASH REGISTER, VAS 6005; University of Illinois.
27. AGRICULTURAL BUSINESS PROCEDURES, VAS 6004; University of Illinois.
28. BETTER COMMUNICATIONS IN SMALL BUSINESS, SBA 1.12:7: Small Business Administration.

29. A HANDBOOK OF SMALL BUSINESS FINANCE, SBA 1.12:15; Small Business Administration.
30. GUIDES FOR PROFIT PLANNING, SBA 1.12:25; Small Business Administration.
31. PERSONNEL MANAGEMENT GUIDE FOR SMALL BUSINESS, SBA 1.12:26: Small Business Administration.
32. FINANCIAL RECORDKEEPING FOR SMALL STORES, SBA 1.12:32; Small Business Administration.
33. SELECTING ADVERTISING MEDIA - A GUIDE FOR SMALL BUSINESS, SBA 1.12:34; Small Business Administration.
34. CUSTOMER CREDIT MANAGEMENT IN AGRICULTURAL BUSINESS, VAS 6008; University of Illinois.
35. AGRICULTURAL CREDIT INSTRUMENTS, VAS 6007; University of Illinois.
36. CREDIT, Farmland Industries, Inc.
37. CREDIT, 1971; Ohio State University.
38. BUSINESS MONEY MANAGEMENT, 1971; Ohio State University.
39. INVENTORY MANAGEMENT AND CONTROL, VAS 6010; University of Illinois.
40. AGRICULTURAL BUSINESS MANAGEMENT - PRINCIPLES THAT AFFECT PRODUCTION, VAS 2040; University of Illinois.
41. OPERATIONS, Farmland Industries, Inc.
42. BUDGETING, Farmland Industries, Inc.
43. ADVERTISING AND PROMOTION, 1971; Ohio State University.
44. SIMPLIFYING WORK IN AN AGRICULTURAL BUSINESS, VAS 6006; University of Illinois.
45. FEEDS, 1972; Ohio State University.
46. AGRICULTURAL CHEMICALS, 1972; Ohio State University.
47. FEED SALES AND SERVICEMAN, Texas A & M University.
48. FERTILIZER SALES AND SERVICEMAN, Texas A & M University.
49. VETERINARY ASSISTANT, Texas A & M University.
50. AGRICULTURAL CHEMICALS SALES AND SERVICEMAN, Texas A & M University.
51. PURINA HEALTH PRODUCTS AND BIOLOGICS, Ralston Purina Company.
52. BATTERY SERVICE MANUAL, Association of Battery Manufacturers.
53. COOP TRUCK TIRE DATA BOOK AND COOP FARM TIRE HANDBOOK, National Cooperatives, Inc.
54. CARE AND OPERATION OF THE PETROLEUM BULK PLANT, Farmland Industries, Inc.
55. MEET MR. TIRE SALESMAN, Farmland Industries, Inc.
56. GUARANTEE POLICY, Farmland Industries, Inc.
57. OPERATING AND MAINTENANCE INSTRUCTIONS FOR GASOLINE TRUCK TANKS AND PUMPING EQUIPMENT, Farmland Industries, Inc.
58. LUBRICANTS, YOUR GUIDE TO BETTER LUBRICATION; Farmland Industries, Inc.
59. TRACTOR FUELS AND LUBRICANTS SELECTING, STORING, OPERATING AND MAINTENANCE MANUAL; Farmland Industries, Inc.
60. BEEF COW MANAGEMENT CALENDAR, AS 373; Iowa State University.
61. THE BEEF COW-CALF HERD IN IOWA - HERD HEALTH, Pm 400; Iowa State University.
62. HANDLING AND FEEDING NEW FEEDER CATTLE, Pm 401; Iowa State University.
63. PRECONDITIONING FEEDER CATTLE, Pm 402; Iowa State University.

64. BASIC FEEDLOT NUTRITION; Pm 555; Iowa State University.
65. RATIONS FOR DAIRY COWS AND HEIFERS, Pm 318; Iowa State University.
66. LIFE CYCLE SWINE NUTRITION, Pm 489; Iowa State University.
67. IOWA SOYBEAN YIELD TEST REPORT, AG 18; Iowa State University.
68. OAT VARIETY PERFORMANCE, AG 10; Iowa State University.
69. IOWA ALFALFA YIELD TEST, AG 84; Iowa State University.
70. TAKE A GOOD SOIL SAMPLE, Pm 237; Iowa State University.
71. UNDERSTANDING YOUR SOIL TEST REPORT, Pm 429; Iowa State University.
72. FERTILIZER SUGGESTIONS FOR CORN YIELDS ABOVE 125 BUSHELS PER ACRE, ST 5; Iowa State University.
73. HERBICIDES FOR WEED CONTROL IN CORN AND SOYBEANS, WC 86; Iowa State University.
74. AGDEX, A SYSTEM FOR CLASSIFYING, INDEXING, AND FILING AGRICULTURAL PUBLICATIONS, 1969; American Vocational Association.
75. FEED ADDITIVE COMPENDIUM: Miller Publishing Company
76. Bulletin Catalog "Publications Off the Press" Agriculture and Home Economics, Cooperative Extension Service, SDSU.

Books:

1. ESSENTIAL ASPECTS OF CAREER PLANNING AND DEVELOPMENT, Atherton and Mumphrey, 1969; Interstate.
2. HANDBOOK OF AGRICULTURAL OCCUPATIONS, Hoover, 1969; Interstate.
3. EXPERIENCE PROGRAMS IN AGRICULTURE, Brinkley and Hammonds, 1970; Interstate.
4. THE ART AND SKILL OF GETTING ALONG WITH PEOPLE, Duvall; Prentice-Hall, Inc.
5. CONTACT, A TEXTBOOK IN APPLIED COMMUNICATIONS, 1970; Prentice-Hall, Inc.
6. CALL ME MISTER, James; Milady Publishing Corporation.
7. HOW TO WIN FRIENDS AND INFLUENCE PEOPLE, Carnegie, Dale; Simon and Schuster.
8. HOW TO STOP WORRYING AND START LIVING, Carnegie, Dale; Simon and Schuster.
9. HUMAN RELATIONS, PROGRAMED TEXT; Kansas State Teacher's College.
10. SUCCESSFUL SALESMANSHIP, Ivey, Horvath, and Tonning, 1965; Prentice-Hall, Inc.
11. FUNDAMENTALS OF SELLING, Wingate and Nolan, Ninth Edition; Southwestern Publishing Company.
12. CREATIVE SELLING, Johnson; Southwestern Publishing Company.
13. STORE SALESMANSHIP, Robinson and others, Prentice-Hall.
14. APPLIED BUSINESS MATHEMATICS, Piper, Fairbank, and Gruber, Ninth Edition.
15. MATHEMATICS SKILL BUILDER, Gossage and Briggs, Third Edition; Southwestern Publishing Company.
16. RETAIL MERCHANDISING, Wingate and Samson, Seventh Edition; Southwestern Publishing Company.
17. AGRICULTURAL MATHEMATICS, Higgs and others, 1973; Interstate.
18. AN INTRODUCTION TO AGRICULTURAL BUSINESS AND INDUSTRY, Weyant, Hoover, and McClay; Interstate.

19. AN INTRODUCTION TO AGRI-BUSINESS MANAGEMENT, Wills, 1973; Interstate.
20. ANCHOR VETERINARY HANDBOOK, Tenth Edition; Anchor Laboratories, Inc.
21. ECONOMICS APPLICATIONS TO AGRICULTURE AND AGRI-BUSINESS, Roy, Corty, and Sullivan; Interstate.
22. MODERN CORN PRODUCTION, Aldrich and Long; F and W Publishing Corporation.
23. COOP FERTILIZER HANDBOOK, Farmland Industries, Inc.
24. ANIMAL SCIENCE AND INDUSTRY, Acker; Prentice Hall, Inc.
25. FARM ESTATE BUSINESS PLANNING, Harl, 1973; Agri-Business Publications.
26. BOOKKEEPING FUNDAMENTALS, Fritz and Hoffman, McGraw-Hill Book Company.
27. CENTURY 21 ACCOUNTING, Boynton and others, Southwestern Publishing Company.
28. EVERYDAY FARM LAWS, Adams and Bedford; Interstate.
29. LAW AND COURT DECISIONS ON AGRICULTURE, Krausy and Hannah; Stipes Publishing Company.
30. DOANE'S FARM MANAGEMENT GUIDE, Ninth Edition; Doane Agricultural Service, Inc.

SOURCES OF REFERENCES AND INSTRUCTIONAL AIDS

1. Addison-Wesley Publishing Company
   Reading, Massachusetts 01867

2. Agri-Business Publications
   Book Division
   1920 Waukegan Road
   Glenview, Illinois 60025

3. American Vocational Association
   Publications Department
   1510 H Street, N.W.
   Washington, D.C. 20005

4. Anchor Laboratories, Inc.
   Division of Philips Roxane, Inc.
   St. Joseph, Missouri 64502

5. Area Vocational Technical School
   Coordinator Vocational Materials Center
   Staples, Minnesota 56479

6. The Association of Battery Manufactures
   19 North Harrison Street
   East Orange, New Jersey 07017

7. California State Polytechnic College
   Vocational Education Productions
   San Luis Obispo, California 93401

8. California, University of
   Audio-Visual Center
   Berkeley, California 94720

9. Copley Production Distribution Center
   434 Downer Place
   Aurora, Illinois 60506

10. DCA Educational Products, Inc.
    4865 Stenton Avenue
    Philadelphia, Pennsylvania 19144

11. Doane Agricultural Service, Inc.
    8900 Manchester Road
    St. Louis, Missouri 63144

12. Eastman Kodak Company
    Audio-Visual Service
    343 State Street
    Rochester, New York 14650

13. Encyclopedia Britannica Films
    1150 West Wilmette Avenue
    Wilmette, Illinois 60091

14. Farm Film Foundation
    1425 H Street, N.W.
    Washington, D.C. 20005

15. Farmland Industries, Inc.
    3315 N. Oak Trfwy.
    Kansas City, Missouri 64116

16. Future Farmer Supply Service
    P.O. Box 15159
    Alexandria, Virginia 22309

17. F & W Publishing Corporation
    22 East 12th Street
    Cincinnati, Ohio 45210

18. Goals Unlimited, Inc.
    Amarillo, Texas 79100

19. Illinois, University of
    Vocational Agriculture Service
    434 Mumford Hall
    Urbana, Illinois 61801

20. Interstate Printers and Publishers
    Danville, Illinois 61832

21. Iowa Grain and Feed Association
201 Shops Building
Des Moines, Iowa 50309

22. Iowa State University
Publications Distribution Center
Printing and Publications Building
Ames, Iowa 50010

23. IAVIM Center
Attention: Thomas A. Hoerner
Agricultural Engineering Department
Iowa State University
Ames, Iowa 50010

24. Kahn, George N. Company
Sales Training Division
212 Fifth Avenue
New York, New York 10010

25. Kansas State Teacher's College
Emporia, Kansas 66801

26. Kent Feeds, Inc.
Muscatine, Iowa 52761

27. Kentucky, University of
Department of Vocational Education
College of Education
Lexington, Kentucky 40500

28. Kirkwood Community College
Bookstore
Box 2068
Cedar Rapids, Iowa 52406

29. McGraw-Hill Book Company
Princeton Road
Hightstown, New Jersey 08520

30. Milady Publishing Corporation
3829 White Plains Road
Bronx, New York 10467

31. Missouri, University of
Instructional Materials Laboratory
8 Industrial Education Building
Columbia, Missouri 65210

32. Modern Talking Pictures, Inc.
Cedar Rapids, Iowa 52406

33. Movies USA, Inc.
729 Seventh Avenue
New York, New York 10000

34. Miller Publishing Company
2501 Wayzata Blvd.
Minneapolis, Minnesota 55440

35. National Association of Manufacturers
277 Park Avenue
New York, New York 10010

36. National Cooperatives, Inc.
Albert Lea, Minnesota 56007

37. Northwestern Bell Telephone Company
Des Moines, Iowa 50309

38. National Sales Executives, Inc.
630 Third Avenue
New York, New York 10017

39. Ohio State University
Department of Agricultural Education
2120 Fyffe Road
Columbus, Ohio 43210

40. Oklahoma State Department of Vocational and Technical Education
The Curriculum and Instructional Materials Center
1515 West Sixth Avenue
Stillwater, Oklahoma 74074

41. Pennsylvania State University
Department of Agricultural Education
University Park, Pennsylvania 16802

42. Prentice-Hall, Inc.
Englewood Cliffs, New Jersey 07632

43. Ralston Purina Company
Checkerboard Square
St. Louis, Missouri 63199

44. Sales and Marketing Executive International
630 Third Avenue
New York, New York 10017

45. Simon and Schuster, Inc.
630 Fifth Avenue
New York, New York 10020

46. Small Business Association
609 Federal Building
210 Walnut Street
Des Moines, Iowa 50309

47. South-Western Publishing Company
5101 Madison Road
Cincinnati, Ohio 45227

48. Successful Farming Vo-Ag Service
1716 Locust Street
Des Moines, Iowa 50303

49. Texas A & M University
P. E. Box 182
College Station, Texas 77843

50. Watt Publishing Company
Mount Morris, Illinois 61054

51. Bulletin Room
Extension Building
South Dakota State University
Brookings, South Dakota 57006

3. Agricultural Mechanics (01.03)

Example Performance Objectives:

1. The student will be able to clean, gap and install a small gas engine spark plug, given a faulty spark plug, spark plug wrench, gap gauge, cleaning materials and a functioning small gas engine. Above to be completed in 20 minutes. Points will be deducted for each .001 error.

2. The student will be able to layout a given pitch rafter accurate for use as a pattern utilizing a length of 2"x4", framing square, steel tape, rafter tables and pencil within 5 minutes. For each 1/8" error 2 points will be deducted.

3. The student will be able to back up 10 feet and park a tractor and four wheel farm wagon in a space 8 inches wider than the wagon within a time limit of 8 minutes. For each 1/2 inch off center 5% of the points allowed will be deducted.

Occupational Titles:

Instructional programs based upon content in this guide will prepare individuals for job entry, will upgrade occupational skills, or will prepare learners for further occupational preparation.

Professional	Skilled
Research Engineer	Mechanic
Plant-Research Engineer	Partsman
Field-Research Engineer	Welder
Plant-Production Engineer	Machinist
Research Draftsman	Bodyman
	Mechanic and Truck Driver

Technical

Assistant Research Engineers
Machinery Designer
Machinery Fieldman

Managerial

General Manager
Sales Manager
Parts Manager
Service Manager
Manager
Assistant Manager
Owner-Manager
Warehouse Manager
Co-Owner-Manager

Supervisory

Shop Foreman
Parts Foreman
Warehouse-Assembly Foreman

Sales

Parts Salesman
Salesman
Truck Salesman
Stock-Control Clerk
Shipping and Receiving Clerk
Truck Mechanic
Welder-Repairman
Welder-Painter
Bricklayer
Carpenter
Building Contractor
Electrician

Semi-Skilled

Truck Driver
Assemblyman
Shop Worker
Deliveryman
Set-Up and Deliveryman
Mechanic's Helper
Pick-Up Man
Customer Farm Machinery Operator

Unskilled

Common Laborer

Office

Clerk
Bookkeeper
Office Secretary
Bookkeeper and Assistant Manager
Office Helper
Accountant

Content Outline:

I. Introduction to Agricultural Mechanics

A. Shop Orientation, management and safety

B. Selecting and using hand tools

C. Power tool use and safety

D. Repairing and sharpening hand tools

E. Making and reading working drawings

F. Fasteners

G. Painting and finishing

H. Glazing

II. Agricultural Power and Machinery

A. Power and machine safety

B. Small gasoline engine, service and maintenance

C. Power units service and maintenance

D. Machinery and equipment

1. Service
2. Efficiency
3. Selection/Purchasing

E. Mobile Hydraulics

III. Agricultural Structures and Conveniences

A. Blue print reading

B. Structure design

1. Livestock
2. Machinery
3. Agribusiness

C. Farm layouts

1. Farmstead
2. Livestock systems
3. Grain and feed storage
4. Material handling

D. Concrete

E. Environment

1. Insulation
2. Ventilation
3. Waste disposal

F. Farm fences

IV. Soil and Water Management

A. Land use management

1. Land classification
2. Terracing and waterways
3. Transit levels

B. Water resources management

1. Irrigation systems
2. Domestic water systems

a. pumps
b. plumbing

V. Agricultural Construction and Maintenance

A. Welding

1. Arc welding and safety
2. Oxy-acetylene welding and safety
3. MIG and TIG welding and safety

B. Metals

1. Hot
2. Cold
3. Soldering

C. Carpentry and wood construction

1. Feeders
2. Trusses
3. Framing

VI. Agricultural Electricity

A. Fundamentals of electricity and safety

B. Electric wiring

C. Electric motors and controls

Suggested Source Materials:

Carpentry and Wood Construction

1. HOW TO USE THE STANLEY TOOL SQUARE, Booklet, Division of Stanley Works.
2. SHARPENING HAND TOOLS, No. 3005, Illinois Vo-Ag Service.
3. SPRAY PAINTING, No. 3015, Illinois Vo-Ag Service.
4. STANLEY TOOL GUIDE HANDBOOK, Division of Stanley Works.
5. ROOFING FARM BUILDINGS, No. F2170, USDA.
6. RAFTER LAYOUT WITH THE FARMING SQUARE, Manual, No. 166, Hobar.
7. PAINTS AND PAINTING, No. AED-13, MWPS.
8. INSULATION AND HEAT LOSS, AED-13, MWPS.
9. INSULATION FOR FARM BUILDINGS, Pamphlet, Illinois Ag. Ed. Department.
10. THE FARM SHOP, Wakeman, MacMillan.

Concrete and Concrete Masonry

1. QUALITY CONCRETE, Course of Study, Hobar Publishers.
2. CONCRETE TECHNOLOGY, Student Manual, Delmar Publishers.
3. DESIGN AND CONTROL OF CONCRETE MIXTURES, Manual, Portland Cement Association.
4. FARM MECHANICS, Phipps, Interstate Printers & Publishers.
5. AGRIBUSINESS MASONRY, (Specilaized Study 11th and 12th grades), Alabama Department of Education.

Electricity - Wiring, Controls and Motors

1. FARM WIRING, PM518, ISU Extension Service.
2. FUNDAMENTALS OF MOTORS, Pamphlet, General Electric.
3. ELECTRICAL WIRING-FUNDAMENTALS AND PLANNING, Booklet, No. 3003a, Illinois Vo-Ag Service.
4. ELECTRICAL WIRING-PROCEDURES AND EXERCISES, Booklet, No. 3016, Illinois Vo-Ag Service.
5. HANDLING FARM MATERIALS, Bulleting No. 198, Maryland Extension Service.
6. AUTOMATIC FEEDING EQUIPMENT FOR LIVESTOCK AND POULTRY, Bulletin No. 2198, USDA.
7. WIRING SIMPLIFIED, Richter, Park Publishing Inc.
8. CONTROLS FOR AUTOMATION IN AGRICULTURE, Student Handbook, Penn. State Ag. Ed. Department.
9. CONTROLS FOR AUTOMATION IN AGRICULTURE, Student Laboratory Manual, Penn. State Ag. Ed. Department.

Farmstead Planning, Service Center and Structures

1. PLANNING AND EQUIPPING A SERVICE CENTER FOR YOUR FARM, PM 525, ISU Extension Service.
2. BEEF HANDBOOK-HOUSING AND EQUIPMENT, No. 6, MWPS.
3. DAIRY HANDBOOK-HOUSING AND EQUIPMENT, No. 7, MWPS.
4. SWINE HANDBOOK-HOUSING AND EQUIPMENT, No. 8, MWPS.
5. DESIGNS FOR GLUED TRUSSES, No. 9, MWPS.
6. DESIGNS FOR SPLIT RING TRUSSES, No. 10, MWPS.
7. DESIGNS FOR NAILED TRUSSES, No. 11, MWPS.
8. PLANNING GRAIN-FEED HANDLING, No. 13, MWPS.
9. PRIVATE WATER SYSTEMS, No. 14, MWPS.
10. HORSE HANDBOOK-HOUSING AND EQUIPMENT, No. 15, MWPS.
11. HOW TO COMPLY WITH IOWA'S FEEDLOT RUNOFF CONTROL REGULATIONS, PM511, ISU Extension Service.
12. FEEDLOT PLANNING GUIDE FOR BEEF, DAIRY AND SWINE, Booklet, A. O. Smith.
13. FARM SILOS, M810, USDA.

Farm Power and Machinery

1. MACHINES FOR POWER FARMING, Stone & Gulvin.
2. FARM TRACTORS, American Oil Company.
3. GULF FARM TRACTOR GUIDE, Gulf Oil Corporation.
4. BOOKLET ON LUBRICATION, Texaco Incorporated.

5. FACTS ABOUT STORAGE BATTERIES, E. S. B. Brands.
6. PARTS AND ASSEMBLY OF A LEAD ACID STORAGE BATTERY, E. S. B. Brands.
7. HOW A STORAGE BATTERY WORKS, E. S. B. Brands.
8. HOW TO READ, USE, AND CARE FOR MICROMETERS AND VERNIER GAGES, L. S. Starrett Company.
9. TRACTOR TIPS, Champion Spark Plug Company.
10. GENERAL THEORIES OF OPERATION, Briggs & Stratton.
11. REPAIR INSTRUCTIONS II, Briggs & Stratton.
12. REPAIR INSTRUCTIONS III, Briggs & Stratton.
13. REPAIR INSTRUCTIONS IV, Briggs & Stratton.
14. HYDRAULICS, International Harvester.
15. WHAT FUEL FOR YOUR TRACTOR, F.S. 1054, ISU Publications.
16. FACTORS INFLUENCING FARM FIELD COSTS, F.S. 1198, ISU Publications.
17. THREE POINT HITCH PLOW ADJUSTMENT, PM 219, ISU Publications.
18. FITTING MACHINERY & EQUIPMENT TO THE FARM, 2039, Illinois Vo-Ag Service.
19. FARM TRACTOR TUNE-UP, 3008, Illinois Vo-Ag Service.
20. VOCATIONAL INSTRUCTIONAL MATERIALS FOR AGRICULTURE, U. S. Government Printing Office.
21. OWNERS MANUAL, Implement Dealer or Company.
22. FUNDAMENTALS OF SERVICE, TIRES AND TRACKS, John Deere Service Publications.
23. FUNDAMENTALS OF SERVICE, SHOP TOOLS, John Deere Service Publications.
24. FUNDAMENTALS OF SERVICE, FUELS, LUBRICANTS & COOLANTS, John Deere Service Publications.
25. FUNDAMENTALS OF SERVICE, MOWING & SPRAYING EQUIPMENT, John Deere Service Publication.

Safety

1. LIGHTNING AND LIGHTNING PROTECTION ON THE FARM, 3011, University of Illinois.
2. SAFETY IN THE AGRICULTURAL MECHANICS SHOP, 3022, University of Illinois.
3. POWER TOOL, SAFETY & OPERATION, 173, Hobar.

Storage and Materials Handling

1. FARMSTEAD SEWAGE AND REFUSE DISPOSAL, 1963, AB274, USDA.
2. FARM POWER AND MACHINERY MANAGEMENT, Hunt, ISU Press.
3. FARM ANIMAL-WASTE MANAGEMENT, NCR 206, ISU Extension Service.
4. ON-THE-FARM FEED PROCESSING SYSTEMS, Circular R43, Auburn Extension Service.
5. FARM UTILITY BUILDINGS, AAVIM.
6. LIVESTOCK WASTE MANAGEMENT IN A QUALITY ENVIRONMENT, Circular 1074, Illinois Vo-Ag Service.
7. MATERIALS HANDLING-GRAINS & FEEDS, Booklet Agricultural Engineering Dept., University of Minnesota.

Welding and Metals

1. LINCOLN ELECTRIC WELDING GUIDE, Booklet, Lincoln Electric Company.
2. WELDER'S GUIDE, 1963, Lincoln Electric Company.
3. OXYACETYLENE WELDING AND CUTTING, Booklet 3001a, Illinois Vo-Ag Service.
4. ARC WELDING, Booklet 3004, Illinois Vo-Ag Service.
5. USING THE CARBON-ARC TORCH, Booklet 3029, Illinois Vo-Ag Service.
6. TUNGSTEN INERT GAS (TIG) WELDING, Booklet 3036, Illinois Vo-Ag Service.
7. METALLIC INERT GAS (MIG) WELDING, Booklet 3037, Illinois Vo-Ag Service.
8. ARC WELDING, Booklet, Lincoln Electric Company.
9. PUMP FUNDAMENTALS, Gould Pumps Inc.
10. WELDING SKILLS AND PRACTICES, Giachino, American Technical Society.
11. Bulletin Catalog "Publications off the Press," Agricultural and Home Economics, Cooperative Extension Service, SDSU.

SOURCES OF REFERENCES AND INSTRUCTIONAL AIDS

1. AAVIM
   Engineering Center
   Athens, Georgia 30602

2. A. C. Spark Plug Division
   General Motors Corporation
   Flint, Michigan 48556

3. American Oil Company
   Advertising Department
   910 South Michigan Avenue
   Chicago, Illinois 60680

4. American Plywood Association
   1119 A Street
   Tacoma, Washington 98401

5. American Technical Society
   Chicago, Illinois 60611

6. A.O. Smith Harvestore Products, Inc.
   550 West Algonquin Road
   Arlington Heights, Illinois 60005

7. BOSCO
   217 East Missouri Avenue
   Kansas City, Missouri 64100

8. Briggs and Stratton
   Service Production Manager
   North 13th Street
   Milwaukee, Wisconsin 53211

9. Champion Spark Plug Company
   Toledo, Ohio 43600

10. DCA Educational Products, Inc.
    4865 Stenton Avenue
    Philadelphia, Pennsylvania 19144

11. Delco-Remy
    Division of General Motors
    Anderson, Indiana 46011

12. Delmar Publishers, Inc.
    Mountain View Avenue
    Albany, New York 12207

13. Department of Public Instruction
    Bureau of Career & Manpower Development
    Madison, Wisconsin 53702

14. Division of Occupational Education
    Agricultural Education Section
    Department of Public Instruction
    Raleigh, North Carolina 27600

15. Edison Electric Institute
    750 Third Avenue
    New York, New York 10017

16. ESB Brands Incorporated
    P.O. Box 6949
    Cleveland, Ohio 44100

17. Farm Department
    National Safety Council
    425 North Michigan Avenue
    Chicago, Illinois 60601

18. Farm Film Foundation
    1425 H. Street, N.W.
    Washington, D.C. 20000

19. Ford Motor Company
    Films Division
    Dearborn, Michigan 48120

20. Geigy Chemical
    P.O. Box 11422
    Greensboro, North Carolina 27409

21. Goodheart-Wilcox
18250 Harwood
Homewood, Illinois 60430

22. Gould Pumps, Inc.
Seneca Falls, New York 13148

23. Gulf Oil Corporation
Gulf Building
Houston, Texas 77000

24. Hobar Publications
1305 Tiller Lane
St. Paul, Minnesota 55112

25. International Harvester
Educational Service
180 North Michigan Avenue
Chicago, Illinois 60601

26. The Interstate Printers & Publishers
Danville, Illinois 61832

27. Iowa Development Commission
Des Moines, Iowa 50309

28. Iowa Farm Bureau
5400 University Avenue
West Des Moines, Iowa 50265

29. IAVIM Center
Attention: Thomas A. Hoerner
Agricultural Engineering Department
Iowa State University
Ames, Iowa 50010

30. Media Resource Center
Iowa State University
Pearson Hall
Ames, Iowa 50010

31. Midwest Plan Service
Iowa State University
Agricultural Engineering Department
Ames, Iowa 50010

32. Publications Distribution Center
Iowa State University
Printing & Publications
Ames, Iowa 50010

33. ISU Press
Iowa State University
Ames, Iowa 50010

34. John Deere Film Library
c/o Modern Talking Picture Service
2323 New Hyde Park Road
New Hyde Park, New York 11040

35. Keystone Steel & Wire Company
Peoria, Illinois 61601

36. Kohler Company
Kohler, Wisconsin 53044

37. Lincoln Electric Company
22801 St. Clair Avenue
Cleveland, Ohio 44117

38. L.S. Starrett Company
Athol, Massachusetts 01331

39. MacMillan Company
Cleveland 17, Ohio 44101

40. McGraw Hill Book Company, Inc.
New York, New York 10001

41. North Dakota State University
Extension Service
Fargo, North Dakota 58100

42. Ohio Agricultural Education
Curriculum Materials Service
Room 201, 2120 Fyffe Road
Columbus, Ohio 43210

43. Oklahoma Curriculum & Instructional Materials Center
State Department of Vocational & Technical Education
Stillwater, Oklahoma 74074

44. Park Publishing Incorporated
P.O. Box 5527
Minneapolis, Minnesota 55408

45. Pennsylvania State University
Department of Agri. Education
University Park, Pennsylvania 16802

46. Portland Cement Association
33 West Grand Avenue
Chicago, Illinois 60610

47. Potomac Edison Company
55 East Washington Street
Hagerstown, Maryland 21740

48. Prentice-Hall, Inc.
Englewood Cliffs, New Jersey 07632

49. Purdue University
Cooperative Extension Service
Agricultural Engineering Department
Lafayette, Indiana 47901

50. Successful Farming Teacher Service
Meredith Publishers
1716 Locust Street
Des Moines, Iowa 50300

51. Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

52. Smith Welding Equipment
Division of Tescom Corp.
2600 Niagara Lane North
Minneapolis, Minnesota 55400

53. Stanley Tools
New Britian, Connecticut 06050

54. State Department of Education
Vocational & Technical Division
Athens, Georgia 30601

55. State Department of Education
Vocational Division
Agribusiness Education Service
Montgomery, Alabama 36104

56. State Education Department
Bureau of Secondary Curriculum Development
Albany, New York 12224

57. Stone & Gulvin
John Wiley & Sons
New York, New York 10001

58. Technical Publications, Inc.
1014 Wyandette Street
Kansas City, Missouri 64100

59. Texaco, Incorporated
135 East 42nd Street
New York, New York 10017

60. Texas A & M University
Teaching Materials Center
College Station, Texas 77843

61. University of Alabama
Extension Service
Auburn, Alabama 36830

62. University of Illinois
Vocational Agriculture Service
College of Agriculture
434 Mumford Hall
Urbana, Illinois 61801

63. University of Minnesota
Agricultural Engineering
Minneapolis, Minnesota 55401

64. University of Missouri
Instructional Materials Laboratory
Columbia, Missouri 65201

65. Victor Company
Denton, Texas 76201

66. Vocational Education Productions
California Poly State University
San Luis Obispo, California 93401

67. Wisconsin Dept. of Public Instruction
Madison, Wisconsin 53703

68. Bulletin Room
Extension Building
South Dakota State University
Brookings, South Dakota 57006

4. Agricultural Products (01.04)

Example Performance Objectives:

1. Given the wholesale beef meat cuts, the student will be able to identify and indicate location of retail meat cuts with 90% accuracy within the period of one minute.

2. Given a sample of wheat and analysis information for the sample the student will be able to place the proper U.S.D A. commodity grade on the sample with 100% accuracy.

3. Given a dozen eggs the student will be able to candle and place the correct U.S.D.A. commodity grade on the eggs with ten eggs graded correctly.

Occupational Titles

Instructional programs based upon content in this guide will prepare individuals for job entry, will upgrade occupational skills, or will prepare learner for further occupational preparation.

Meat And Meat By-Products

Brand Inspector
Butcher, All-Round
Commission Man
Department Manager
Livestock Buyer
Livestock Inspector
Locker Plant Operator
Maintenance Man
Market Research Analyst
Meat Grader
Meat Processing Plant Manager
Meat Inspector
Processing Operation Employee
Quality Control Officer
Salesman
Scale Operator
Smoker
Supervisor
Traffic Management Officer
Trucker
Warehouseman
Yard Man

Vegetable and Fruit Processing

Department Manager
Inspector
Maintenance Man
Market Research Analyst
Plant Manager
Processing Operations Employee
Produce Buyer
Produce Grader
Quality Control Officer
Receiver
Salesman
Sampler
Scale Operator
Supervisor
Traffic Management Officer
Trucker
Warehouseman

Grain And By-Products

Commission Man

Wool And Other Fiber Products

Commission Man
Department Manager
Maintenance Man
Market Research Analyst
Mill Manager
Processing Operation Employee
Salesman
Scale Operator
Supervisor
Traffic Management Officer
Trucker
Quality Control Officer
Warehouseman
Wool Blender
Wool Buyer
Wool Grader
Wool Inspector
Wool Sorter

Dairy Processing

Dairy Products Buyer
Dairy Tester
Department Manager
Field Contact Man
Inspector
Maintenance Man
Market Research Analyst
Milk Receiver
Milk Sampler
Plant Manager
Processing Operations Employee
Product Grader
Quality Control Officer
Salesman
Scale Operator
Supervisor
Traffic Management Officer
Trucker
Warehouseman

Egg Processing

Commission Man
Department Processing Manager
Egg Candler

Fieldman
Grain Buyer
Grain Grader
Grain Processing Employee
Grain Mixer
Grain Elevator Employee
Inspector
Maintenance Man
Manager Grain Elevator
Market Research Analyst
Mill Operator
Quality Control Officer
Salesman
Scale Operator
Seed Analyst
Supervisor
Traffic Management Officer
Trucker
Warehouseman
Egg Grader
Egg Inspector
Maintenance Man
Market Research Analyst
Plant Processing Manager
Poultry And Egg Buyer
Processing Operations Employee
Quality Control Officer
Salesman
Scale Operator
Supervisor
Traffic Management Officer
Trucker
Warehouseman

Content Outline:

I. Plant Products

A. Grain and grain products

1. Purchasing of grain
2. Grain conditioning and storage
3. Warehousing of grain
4. Transportation of grain
5. Processing grain into human and animal foods
6. Marketing processed foods
7. Government regulations

B. Vegetable/Fruit processing, distribution and marketing

1. Purchasing of raw product
2. Assembly and receiving the raw product
3. Maintaining sanitary equipment and facilities
4. Processing of raw products
5. Storage and warehousing
6. Transportation
7. Marketing
8. Government regulations

C. Misc. Crops

1. Commercial Seed Processing
2. Alfalfa pelleting
3. Edible beans
4. Sunflowers
5. Flax straw
6. Sugar beets
7. Potatoes
8. Popcorn

II. Animal Products

A. Meat processing and meat by-products

1. Livestock purchase
2. Assembly of livestock
3. Transportation to processing plants
4. Slaughter - Commercial/Home
5. Maintaining sanitary facilities and equipment
6. Breaking and fabrication
7. Storage
8. Packaging
9. By-products
10. Marketing of all products
11. Transportation from wholesale to retail
12. Government regulations

B. Dairy

1. Collect milk from producers
2. Receive, clarify and filter milk
3. Determine milk quality
4. Processing milk
5. By-products and special products
6. Maintaining sanitary equipment
7. Marketing
8. Government regulations

C. Eggs

1. Assembly
2. Sanitizing
3. Grading and pricing
4. Packaging
5. Storage
6. Transportation
7. Marketing
8. Processing
9. Government regulations

D. Miscellaneous animal products

1. Honey
2. Wool
3. Manure processing

Suggested Source Materials

Bulletins:

Bulletin Catalog "Publications off the Press," Agriculture and Home Economics, Cooperative Extension Service, SDSU.

Books:

1. FOOD SCIENCE, Potter, AVI Publishing.
2. FUNDAMENTALS OF FOOD PROCESSING OPERATIONS, Heid and Joslyn, AVI Publishing.
3. TECHNOLOGY OF FOOD PRESERVATION, Derosier, AVI Publishing.
4. INTRODUCTION TO FEED SCIENCE AND TECHNOLOGY, Stewart and Amerine Academic Press.

SOURCES OF REFERENCES AND INSTRUCTIONAL AIDS

1. Agricultural Institute
   Patterson Hall
   North Carolina State University
   Raleigh, North Carolina 27607

2. American Can Company
   7230 Park Avenue
   New York, New York 10017

3. AVI Publishing Company, Inc.
   P.O. Box 831
   Westport, Connecticut 06880

4. Academic Press, Inc.
   111 Fifth Avenue
   New York, New York 10003

5. American Sheep Producers Council
   200 Clayton Street
   Denver, Colorado 80206

6. American Meat Institute
   59 East Van Buren Street
   Chicago, Illinois 60605

7. American Wool Council
   200 Clayton Street
   Denver, Colorado 80206

8. Mr. Belmer Ekis, Office Supervisor
   USDA Consumer & Marketing Service
   Room 606
   1912 Grand Avenue
   Des Moines, Iowa 50309

9. The Canning Trade
   2619 Maryland Avenue
   Baltimore, Maryland 21218

10. Chemical Publishing Company
    New York, New York 10000

11. J. G. Ferguson Publishing Company
6 North Michigan Avenue
Chicago, Illinois 60602

12. Grain and Feed Dealers National Ass'n.
500 Folger Building
725 15th Street, N.W.
Washington, D.C. 20005

13. Industrywide Lamb & Wool Planning Comm.
600 Crandall Building
Salt Lake City, Utah 84101

14. Interstate Printers and Publishers
Danville, Illinois 61832

15. Institute of Food Technologists
176 Adams Street
Chicago, Illinois 60603

16. Iowa State Commerce Commission
Warehouse Division
Des Moines, Iowa 50309

17. Iowa State University

Dept. of Dairy & Food Industry
Dairy Industry Building

Media Resources Center
Pearson Hall

ISU Press
Press Building

Ames, Iowa 50010

18. John Wiley and Sons
605 Third Avenue
New York, New York 10016

19. Lea and Febiger
600 Washington Square
Philadelphia, Pennsylvania 19106

20. J. B. Lippincott Company
E. Washington Square
Philadelphia, Pennsylvania 19105

21. Michigan State University
Extension Service
East Lansing, Michigan 48823

22. Milk Industry Foundation
910 17th Street, N.W.
Washington, D.C. 20006

23. Modern Talking Pictures Service
Cedar Rapids, Iowa 52406

24. Moraine Park Technical Institute
Beaver Dam, Wisconsin 53916

25. Moraine Park Technical Institute
Fon du Lac, Wisconsin 54935

26. Movies, USA, Incorporated
729 Seventh Avenue
New York, New York 10000

27. NASCO
Fort Atkinson, Wisconsin 53538

28. National Livestock & Meat Board
26 South Wabash Avenue
Chicago, Illinois 60604

29. North Central Wool Marketing Corp.
101 27th Avenue, S.E.
Minneapolis, Minnesota 55414

30. Ohio State University
Agricultural Extension Service
Columbus, Ohio 43210

31. Prentice Hall, Inc.
Englewood Cliffs, New Jersey 07632

32. Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

33. Teaching Materials Center
Texas A & M University
College Station, Texas 77843

34. University of Illinois

Vo-Ag Service

Cooperative Extension Service

Urbana, Illinois 61801

35. University of Michigan
Audio Visual Education Center
Ann Arbor, Michigan 48103

36. University of Missouri
Cooperative Extension Service
Columbis, Missouri 62501

37. University of Wisconsin

Bureau of Audio-Visual Instruction

Bulletin Mailing Room, College of Agriculture

Madison, Wisconsin 53702

38. United States Department of Agriculture

Consumers Mktg. Service, Poultry Division

Statistical Reporting Service

Marketing Service

Washington, D.C. 20250

39. Vocational Education Productions
California Polytech, State University
San Luis Obispo, California 93401

40. Western Poultry Congress
P.O. Box 307
Baldwin Park, California 91706

41. Wisconsin Department of Public Instruction
Madison, Wisconsin 53700

42. Wisconsin State Employment Service
Madison, Wisconsin 53700

43. Bulletin Room
Extension Building
South Dakota State University
Brookings, South Dakota 57006

5. Ornamental Horticulture (Production, Processing, Marketing, and Services) (01.05)

Example Performance Objectives:

1. Given an injured tree and the proper tools and materials, the student will properly remove or repair the injury to the satisfaction of the instructor.

2. Given a soil sample and a soil testing kit, the student will test the sample for pH, N, P, and K in a period of 90 minutes and be 90% accurate.

1. Given ten plant insects, the student will correctly identify the insects and make one recommendation for control of each insect in a period of 30 minutes and be 90% accurate.

Occupational Titles

Instructional programs based upon content in this guide will prepare individuals for job entry, will upgrade occupational skills, or will prepare the learner for further occupational preparation.

Production Oriented Occupations

Greenhouse Worker
Nursery Worker
Nursery Owner
Vegetable Producer
Christmas Tree Producer
Turf Producer
Tree Farmer
Greenhouse Owner
Flower Production Employer
Bedder
Vegetable Grower Employee
Fruit Producer
Mushroom Grower
Nursery Employee
Wholesale Flower Producer

Technical Oriented Occupations

Greenskeeper
Agronomist
Equipment Mechanic
Plant Propagator
Lawn Specialist
Tree Surgeon
Tree Sprayer
Tree Pruner
Landscape Architect
Arborist
Pest Control Technician
Inspector
Research
Extension Specialist
Landscape Designer
Landscape Consultant
Plant Breeder
Lab Technician

Sales and Service Occupations

Flower Shop Worker
Florist
Garden Center Manager
Horticultural Products Sales Person
Vegetable Market Manager
Fruit Marker Manager
Fruit Market Employee
Floral Arrangement Specialist
Produce Dept. Manager - Grocery Store
Deliveryman
Garden Center Employee

Related Occupations

Landscaping Assistant
Landscape Gardener
Athletic Field Groundskeeper
Teaching (Vo-Ag Instructor)
Industrial Grounds Maintenance Person
Golf Course Employee
City, State and National Park Employee
State Gardener
Highway Maintenance Person
Park Superintendent
Groundskeeper
Director of Seed Company
Editor-Horticultural Publications
Landscape Construction
Office Worker
Physical Plant Manager
Chemical Company Representative
Horticultural Equipment Sales
Landscape Contractor
Horticultural Products Broker

Content Outline

I. General

A. Plant classification

B. Plant propagation

C. Growth and development of plants

D. Soil and growth media

E. Plant pests and diseases

F. Construction, maintenance and utilization of growing structures

G. Hand tools, power tools, and hardware; safety

H. Operation and maintenance of small gas engines, and power units; safety

I. Operation and maintenance of horticulture equipment; safety

II. Specialized Areas

A. Arboriculture 01.0501

1. Identification and selection of trees and shrubs
2. Planting trees and shrubs
3. Selection and application of fertilizers and pesticides
4. Pruning
5. Maintenance procedures

B. Floriculture 01.0502

1. Planting media preparation
2. Greenhouse plant propagation
3. Fertilization and pest control
4. Maintaining desirable environmental conditions
5. Uses and characteristics of flowers, plants, and other decorative materials
6. Flower arrangements and design
7. Greenhouse management

C. Nursery 01.0505

1. Identification and selection of nursery stock
2. Planting media preparation
3. Planting and transplanting nursery stock
4. Sexual propagation
5. Propagation by cutting, grafting, budding
6. Fertilizers and fertilization
7. Pruning nursery stock

8. Weed control
9. Disease, insect, and pest control
10. Chemical safety
11. Nursery management

D. Landscaping 01.0504

1. Site selection and preparation
2. Selecting and planting landscape stock
3. Watering weed control
4. Fertilizers and fertilization
5. Insect and disease control
6. Pruning
7. Landscape business management

E. Turfgrass maintenance and management 01.0506

1. Selecting turfgrass for new seedings
2. Turf site preparation
3. Turf establishment by seeding and vegetable planting
4. Mowing turf areas
5. Watering turf
6. Turf weed control
7. Disease, insect and pest control
8. Chemical safety
9. Renovation of old turf areas

Suggested Source Materials

1. ALL ABOUT VEGETABLES, Chevron Chemical Company.
2. ANNUALS FOR CUT FLOWERS, Potter Florist Publishing Company.
3. APPROVED PRACTICES IN FRUIT PRODUCTION, Scheer-Jurgenson; Interstate Printers & Publishers.
4. ARRANGING FLOWERS IN VASES AND BOWLS, University of Illinois.
5. HOME GARDENING, Meredith Corporation.
6. BUYING BEDDING PLANTS, University of Illinois.
7. SMALL ENGINE SERVICE MANUAL, Briggs and Stratton Corp.
8. A CHILD'S GARDEN, Chevron Chemical Company.
9. COURSE OUTLINE FOR HORTICULTURE, 12 Modules; Ohio State University.
10. EXPLORING EDUCATIONAL OPPORTUNITIES, University of Illinois.
11. 50 LABORATORY EXERCISES FOR VOC. HORT, Hemp; Interstate Printers & Publishers.
12. FLOWERS AND GREENHOUSES (Bulletin Packet) University of Illinois.
13. FLORIST DECORATIONS FOR THE TABLE, Stevenson; Florist Publishing Company.
14. FLOWER AND PLANT PRODUCTION IN THE GREENHOUSE, Nelson; Interstate Printers & Publishers.
15. FRUIT GROWING, Schneider & Scarborough; Prentice Hall.
16. FUNDAMENTALS OF HORTICULTURE, Edmondson-Andrews; McGraw Hill.
17. GOLF TURF MANAGEMENT, Musser; McGraw Hill.
18. HANDBOOK FOR VEGETABLE GROWERS, Knott; Wiley Company.

19. HORTICULTURAL SCIENCE, Janik; W. H. Freeman and Company.
20. HOW TO USE A CHAIN SAW, McCullock Motor Company.
21. LANDSCAPING, Department of Public Instruction; Indianapolis, Indiana.
22. LANDSCAPING DO'S AND DON'TS, Interstate Printers & Publishers.
23. LANDSCAPE TREES AND SHRUBS, Galloway Gardens.
24. THE LAWN BOOK, Macmillan.
25. LAWNS AND GROUND COVER, Sunset Editorial Staff; Lane Book Company.
26. MANAGEMENT PLANS FOR GREENHOUSES, George Ball Company.
27. MODERN FRUIT SCIENCE, Childers; Horticultural Publications.
28. OPERATING A GARDEN CENTER, Pinney; Florist Publishing Company.
29. ORNAMENTAL HORTICULTURE INSTRUCTIONAL MATERIAL, Pennsylvania State University.
30. ORNAMENTAL HORTICULTURE; A GUIDE FOR ORGANIZING OCCUPATIONAL PROGRAMS, University of the State of New York.
31. ORNAMENTAL HORTICULTURE, Utah State University.
32. ORNAMENTAL HORTICULTURE, Greenhouse Management; Wisconsin State.
33. ORNAMENTAL HORTICULTURE, Montgomery, Alabama.
34. ORNAMENTAL HORTICULTURE, State Department of Education; Richmond, Virginia.
35. OPERATING A RETAIL FLOWER SHOP, University of Illinois.
36. OUTLOOK FOR FRUIT, USDA.
37. OUTLOOK FOR VEGETABLES, USDA.
38. PLANT PROPAGATION, PRINCIPLES AND PRACTICES, Hartman-Kester, Prentice Hall.
39. PRINCIPLES OF HORTICULTURE, Denison; Macmillan Company.
40. PRODUCING POINSETTIAS COMMERCIALLY, University of Illinois.
41. PRODUCING VEGETABLE CROPS, Ware and McCollum; Interstate Printers & Publishers.
42. RETAIL FLORIST, Liosvold; Florist Publishing Company.
43. RETAIL FLOWER SHOP OPERATION AND MANAGEMENT, Penn State University.
44. SHRUB IDENTIFICATION BOOK, Symonds; Barrows & Company.
45. SHRUBS FOR LANDSCAPING, IDENTIFICATION, CULTURE, USE, Ohio State University.
46. SIMPLIFIED FLOWER ARRANGING, Robert; Florist Publishing Company.
47. SMALL ENGINES, PRINCIPLES OF OPERATION, College of Agriculture; Urbana, Illinois.
48. SOILS, Yearbook of Agriculture; USDA.
49. STUDENT GUIDE FOR FLORIST HELPER, University of Kentucky.
50. TEACHERS GUIDE FOR ORNAMENTAL HORTICULTURE, University of Georgia.
51. THE NURSERY WORKER PART I & II, Ohio State University.
52. TRANSPLANTING SHADE TREES, University of Illinois.
53. TREE IDENTIFICATION BOOK, Symonds; Barrows & Company.
54. TREES FOR LANDSCAPING, Ohio State University.
55. TURF GRASS PEST CONTROL, University of Illinois.
56. TURF GRASS DISEASES AND THEIR CONTROL, University of Illinois.
57. TWO-YEAR PROGRAM IN VOCATIONAL HORTICULTURE 1 & 2, Department of Vocational Education; St. Paul, Minnesota.
58. TURF MANAGEMENT HANDBOOK, Sprague; Interstate Publishers.

59. WEDDING FLOWER DECORATIONS, Clark; Florist Publishing Company.
60. Bulletin Catalog "Publications off the Press," Agriculture and Home Economics, Cooperative Extension Service, SDSU.

SOURCES OF REFERENCES AND INSTRUCTIONAL AIDS

1. State Department of Education
   Vocational Division
   Agri-Business Education Service
   Montgomery, Alabama 36104

2. University of Arizona
   Department of Agricultural Education
   Tucson, Arizona 85702

3. McCullock Motors Company
   Los Angeles, California 90052

4. California Chemical Company
   Ortho Division
   200 Bush Street
   San Francisco, California 94101

5. Vocational Education Publications
   California State Poly Tech College
   San Luis Obispo, California 93401

6. W. H. Freeman Company
   San Francisco, California 94101

7. Superintendent of Documents
   Washington, D.C. 20402

8. Gallaway Gardens
   Educational Department
   Box 537
   Pine Mountain, Georgia 31822

9. Garrard Publishing Company
   Champaign, Illinois 61820

10. Iowa State University
    Ames, Iowa 50010

11. Iowa State University Press
    Ames, Iowa 50010

12. Florist Publishing Company
    343 Dearborn
    Chicago, Illinois 60604

13. American Nurserymen
    343 Dearborn
    Chicago, Illinois 60604

14. George T. Ball, Inc.
West Chicago, Illinois 60185

15. University of Illinois
Vocational Agricultural Service
534 Mumford Hall
Urbana, Illinois 61804

16. Interstate Printers and Publishers
Danville, Illinois 61832

17. Indiana State University
Vocational Instructional Materials
Division of Industrial Education
Terre Haute, Indiana 67809

18. University of Kentucky
Department of Agricultural Education
Lexington, Kentucky 40507

19. Michigan State University
East Lansing, Michigan 48823

20. Department of Vocational Education
Capital Square Building
St. Paul, Minnesota 55101

21. 3 M Company
Visual Products Division
2501 Hudson Road
St. Paul, Minnesota 55101

22. Technical Publications
934 Wyandotte Street
Kansas City, Missouri 64105

23. Bureau of Audio Visual Instruction
Extension Division
University of Nebraska
Lincoln, Nebraska 68503

24. D Van Nostrand Company, Inc.
120 Alexander Street
Princeton, New Jersey 07632

25. Prentice Hall, Inc.
Englewood Cliffs, New Jersey 07632

26. Cornell University
Ithaca, New York 14850

27. Macmillan Company
866 Third Avenue
New York, New York 10022

28. McGraw-Hill Book Company
1221 Avenue of the Americas
New York, New York 10020

29. New York State University
State Education Department
Bureau of Secondary Curriculum Dev.
Albany, New York 12224

30. Vocational Guidance Manuals, Inc.
800 Second Avenue
New York, New York 10017

31. Meredith Publishing Company
Des Moines, Iowa 50336

32. Jackson Perkins Company
Newark, New York 14513

33. John Wiley & Sons, Inc.
605 Third Avenue
New York, New York 10016

34. Barrows and Company
425 Fourth Avenue
New York, New York 10016

35. Rotary Graphic Press
New York, New York 10001

36. Ciegy Agricultural Chemicals
P.O. Box 11422
Greensboro, North Carolina 27409

37. Modern Talking Pictures Service
3 East 54th Street
New York, New York 10001

38. Division of Vocational Education
Department of Public Instruction
Agricultural Education Section
Raleigh, North Carolina 27602

39. North Dakota Voc-Ag. Association
100 Morrill Hall
North Dakota State University
Fargo, North Dakota 58102

40. Ohio Agricultural Education
Curriculum Materials Service
2120 Fyffe Road
Columbus, Ohio 43210

41. Ohio State University
The Center for Vocational and Technical Education
1900 Kenny Road
Columbus, Ohio 43210

42. Pennsylvania State University
College of Agriculture Experiment Station
Department of Agriculture Education
University Park, Pennsylvania 16802

43. Agricultural Education
Teaching Materials Center
Texas A & M University
College Station, Texas 77843

44. Utah State University
Department of Agricultural Education
Logan, Utah 84321

45. State Department of Education
Agriculture Education Service
Richmond, Virginia 23216

46. NASCO
Fort Atkinson, Wisconsin 53538

47. Briggs and Stratton Corp.
Milwaukee, Wisconsin 53202

48. Bulletin Room
Extension Building
South Dakota State University
Brookings, South Dakota 57006

6. Agricultural Resources (Conservation, Utilization and Services) (01.06)

Example of performance objective:

1. The student should be able to, given a specific career in which the student is interested, determine the competencies and requirements needed by persons to enter and advance in that career in accordance with the Dictionary of Occupational Titles.

2. The student should be able to, upon determining the requirements and competencies needed to enter a job, develop a personal plan which will aid him in acquiring the competencies and meeting the requirements needed for entry in that job to the satisfaction of the instructor.

3. The student should be able to, in seeking information about job opportunities, survey or obtain literature information which will assist him in determining the number and kind of job opportunities that are available in Agricultural resources.

Occupational Titles:

Instructional programs based upon content in this guide will prepare individuals for job entry, will upgrade occupational skills, or will prepare learners for further occupational preparation.

Air Resource Management

Air Pollution Control Worker
Air Monitoring Technician
Smoke Tester
Air Analyst
Compliance Section Technician
Engineering Section Technician
Air Pollution Control Supervisor
Air Pollution Control Meteorologist
Air Pollution Control Chemist
Air Pollution Control Engineer

Fish Management

Fish Hatchery Worker
Fish Farmer
Conservation Patrolman
Fish Culturist
Fisheries Scientist
Fish Hatchery Superintendent
Fisheries Technician
Fishery Biologist
Fishery Manager

Forest Resource Management

Tree Planter
Forestry Aide
Tree Farmer
Forest Technician
Wood Supervisor
Forest Nursery Technician
Forest Cruiser
Forest Warden
Forester
Forest Entomologist
Consulting Forester
Forest Examiner
Forest Supervisor

Land Use Planning

Surveyor's Assistant-Rodman
Surveyor's Assistant-Chainman
Surveyor
City Planning Aide
Urban Planning Technician
Zoning Inspector
Zoning Technician
Chief Planning Officer
City Planning Engineer
Urban Planner
Regional Planner
Land Use Planner
Architectural Engineer
Mining Area Restoration Worker
Mining Area Restoration Technician
Open Pit Mine Conservation Inspector
Mineralogist
Geologist

Outdoor Recreation Planning

Grounds Keeper
Parks Caretaker
Parks Worker
Recreation Farm Manager
Dude Ranch Manager
Hunting and Fishing Guide
Recreational Development Technician
Fish and Game Club Manager
Ski Patrolman
Winter Sports Manager
Guest Farm Manager
Parks Foreman
Parks Naturalist
Parks Superintendent
Parks Ranger
Campground Caretaker
Camp Counselor

Forest Engineer
Forest Ecologist
Forest Ranger
Silviculturalist
Saw Mill Manager
Saw Mill Foreman
Saw Mill Worker
Forest Manager

Water Resource Management

Watershed Manager
Water Filter Cleaner
Wastewater Disposal Worker
Basin Operator
Watershed Tender
Public Health Engineering Aide
Sanitarian Aide
Stream Sanitation Technician
Sanitarian
Limnologist
Water and Waste Treatment Plant Manager
Water Quality Chemist
Public Health Bacteriologist
Industrial Wastes Inspector
Hydrologist
Water Resources Investigator
Water Well Inspector
Water Treatment Plant Technician
Wastewater Treatment Plant Technician
Water Economist

Soil Conservation

Soil Conservation Aids
Soil Conservation Technician
Engineering Technician
Soil Scientist
Soil Fertility Expert
Soil Bacteriologist
Agrogeologist (Soil Mapper or Surveyor)
Soil Conservationist
Drainage Design Coordinator
ASCS Supervisor
ASCS Manager

Wildlife Management

Game Farm Worker
Gamekeeper
Wildlife Conservation Officer
Animal Shelter Keeper
Wildlife Technician
Game Warden
Animal Shelter Manager
Game Propagator
Wildlife Biologist
Wildlife Specialist
Wildlife Administrator
Waterfowl Specialist

Content Outline:

I. Forests

A. Importance of forests

B. Timber stand improvement

C. Forest disease, insect and pest control

D. Fire prevention and control

E. Forest management services

II. Recreation

A. Demand for recreation

B. Kinds of outdoor recreational enterprises

C. Sources of supplemental income

D. Exploring opportunities for establishing a recreational enterprise

E. Develop a safety program for a recreational facility

F. Laws regulating recreational enterprises

G. Financing recreation

H. Advertising and promoting

I. Personnel management

III. Soil

A. Becoming familiar with soil and soil formation

B. Determine properties of soil

C. Erosion

D. Land use classification

E. Land use recommendation

F. Practices for controlling erosion and sedimentation

G. Soil survey and land layout

H. Soil management advisory services available

I. Hazards in special uses

J. Zoning

IV. Wildlife

A. Identifying important wildlife species

B. Managing wildlife populations

C. Establishing and managing wildlife preserves

D. State and federal agencies in wildlife conservation

E. Game bird management and propagation

F. Fish management and propagation

G. Surveying wildlife and wildlife cover

V. Water

A. Sources

B. Demands for water

C. Water storage

D. Effects of storage on water

E. Watershed protection

F. Evaluating water quality

G. Water treatment

H. Waste water management

I. Weather modification

VI. Air

A. Natural processes in the atmosphere

B. Pollution in the atmosphere

C. Expressing concentration of pollutants

D. Effects of air pollution

E. Maintaining air quality

F. Air pollution sampling and monitoring

G. Controlling noise

H. Controlling odor

I. Weather interpretation

VII. Range

A. Range plant ecology

B. Range plant identification

C. Range condition, trend and utilization

D. Range grazing management

E. Range renovation practices

F. Management services available

VIII. Mining area restoration (coal, gravel, minerals, quarries and roads)

A. Characteristics and physical condition of disturbed land

B. Adapting reclamation to site

C. Steps in basic reclamation

D. Law and surface mining

E. Conservation effort

IX. Forestry (Production, processing, management, marketing and services)

A. Tree identification

B. Establishing the forest

C. Forest mensuration

D. Planning groves and windbreaks

E. Christmas tree production

F. Logging

G. Wood utilization

H. Forest Management Services

Suggested Source Materials:

Bulletins:

1. CAREERS IN WATER POLLUTION CONTROL; Water Pollution Control Federation.
2. SUGGESTIONS & PROCEDURES FOR DEVELOPING TEACHING-LEARNING STATIONS; North Carolina Department of Public Instruction.
3. OUTDOOR RECREATION IN IOWA TO 1980; Pm461, I.S.U. Publications.
4. OUTDOOR RECREATION RESOURCES; I.S.U. Publications.
5. SUGGESTIONS & PROCEDURES IN DEVELOPING NATURE TRAILS; North Carolina Department of Public Instruction.
6. THE IOWA CONSERVATIONIST-Magazine; Iowa Conservation Commission.
7. IOWA SOIL CONSERVATIONIST-Magazine; Soil Conservation Service.
8. RURAL ENVIRONMENTAL ASSISTANCE PROGRAM; A.S.C.S.
9. AGRICULTURE U.S.A.; U.S.D.A. Office of Information.
10. RESOURCE CONSERVATION IN IOWA; S.C.S.
11. E.Q. INDEX; National Wildlife Federation.
12. CAREERS IN WILDLIFE CONSERVATION; C6. Cornell University.
13. CONSERVATION ACTION HANDBOOK; C7. Cornell University.
14. AN OUTLINE FOR TEACHING CONSERVATION IN HIGH SCHOOL; PA201. U.S.D.A. Office of Information. 1970.

15. TEACHING CONSERVATION THROUGH OUTDOOR EDUCATION AREAS; PA837. U.S.D.A. Office of Information. 1970.
16. TEACHING SOIL AND WATER CONSERVATION: A CLASSROOM & FIELD GUIDE; PA341, U.S.D.A. Office of Information. 1970.
17. OUTDOOR CLASSROOM ON SCHOOL SITES; PA975. U.S.D.A. Office of Information. 1972.
18. ENVIRONMENTAL HEALTH AND POLLUTION CONTROL; PM486. I.S.U. Publications.
19. PLANNING A CAREER IN FISH & WILDLIFE MANAGEMENT; State Conservation Commission.
20. AGRICULTURAL RESEARCH: IMPACT ON ENVIRONMENT; SR69. I.S.U. Publications.
21. FARM MANUAL: ENVIRONMENT; Standard Oil Division.
22. A WILDLIFE CONSERVATION CAREER FOR YOU; Wildlife Society.
23. AGRICULTURE, CAREERS THAT IMPROVE THE QUALITY OF LIFE, RESTORE THE ENVIRONMENT, FEED THE WORLD; Maryland Department of Education.
24. CONSERVATION OF NATURAL RESOURCES: PESTICIDES; Cornell University.
25. CAREERS IN WILDLIFE CONSERVATION; Olin Mathieson Chemical Corporation.
26. Bulletin Catalog "Publications off the Press," Agricultural and Home Economics, Cooperative Extension Service, SDSU.

Air Resource Management

1. AIR POLLUTION INJURY TO VEGETATION; AP71. National Air Pollution Control Administration.
2. IOWA WEEKLY WEATHER & CROP REPORT; Statistical Reporting Service.
3. AIR POLLUTION: THE FACTS; National Tuberculosis & Respiratory Disease Association.
4. LIGHTNING OVER IOWA; I.S.U. Publications.
5. OUR "USUAL" WEATHER; I.S.U. Publications.
6. HOW WEATHER FORECASTS ARE MADE; I.S.U. Publications.
7. CLOUDS: THE SIGNPOSTS OF THE SKY; I.S.U. Publication.
8. THE AIR WE LIVE IN; I.S.U. Publications.
9. WHAT IS WEATHER?; I.S.U. Publications.
10. WHY OUR WEATHER CHANGES; I.S.U. Publications.
11. FARM MANUAL: WEATHER; Standard Oil Division.
12. WEATHER MANAGEMENT; Successful Farming.
13. SMOG & WEATHER; National Coal Association.
14. NOISE POLLUTION CONTROL IN ILLINOIS; Illinois Environmental Protection Agency.

Fish Management

1. POND FISH & FISHING IN ILLINOIS; Lipinat. University of Illinois.
2. IOWA ORNITHOLOGIST UNION FIELD CHECK LIST; Iowa Ornithologist Union.
3. WILDLIFE OF LAKES, STREAMS & MARSHES; National Wildlife Federation.
4. WARM WATER PONDS FOR FISHING; No. 2210. U.S.D.A. Office of Information.
5. MANAGING FARM FISHPONDS FOR BASS & BLUEGILLS; No. 2094. U.S.D.A. Office of Information.

6. FOR BETTER FISHING; FS1193. I.S.U. Publications.
7. TROUT FARMING; No. 552. U.S.D.A. Office of Information.
8. FISHERIES AS A PROFESSION; American Fisheries Society.
9. CATFISH FARMING: A NEW FARM CROP; F2244. U.S.D.A. Office of Information 1969.
10. TROUT PONDS FOR RECREATION; F2249. U.S.D.A. Office of Information. 1971.
11. TROUT FARMING: COULD TROUT FARMING BE PROFITABLE FOR YOU?; L5521. U.S.D.A. Office of Information. 1969.

Forest Resource Management

1. IOWA CHRISTMAS TREE PRODUCERS; F283. I.S.U. Publications.
2. DIRECTORY OF SAWMILLS AND VENEER MILLS OF IOWA; Pm364. I.S.U. Publications.
3. THE WAY TO WOODS PROFITS IN IOWA; F210. I.S.U. Publications.
4. KNOW YOUR TREES; C12. Cornell University.
5. CHRISTMAS TREES - A CASH CROP; C15. Cornell University.
6. FOREST ACTIVITIES - A GUIDE FOR YOUTH GROUP LEADERS; PA457. U.S.D.A. Office of Information. 1970.
7. TREE WINDBREAKS FOR THE CENTRAL GREAT PLAINS; AH250. U.S.D.A. Office of Information. 1964.
8. YOUR WATER SUPPLY & FORESTS; AB305. U.S.D.A. Office of Information. 1971.
9. SPECIAL FOREST PRODUCTS FOR PROFIT; AB278. U.S.D.A. Office of Information. 1963.
10. SHELTERBELTS FOR THE NORTHERN GREAT PLAINS; F2109. U.S.D.A. Office of Information. 1966.
11. PLANTING BLACK WALNUT FOR TIMBER; L487. U.S.D.A. Office of Information. 1971.
12. SELECTING AND PLANTING WINDBREAK TREES; Pm360. I.S.U. Publications.
13. FORESTRY; I.S.U. Publications.
14. SELECTION & MAINTENANCE OF NATURAL CHRISTMAS TREES; F293. I.S.U. Publications.
15. MANAGE YOUR FARM WOODLAND FOR GREATER PROFIT; Pm217. I.S.U. Publications.
16. MARKETING IOWA TIMBER; Pm413. I.S.U. Publications.
17. PROPERTIES & USES OF IOWA HARDWOODS; Pm329. I.S.U. Publications.
18. SHADE TREES FOR IOWA; Pm330. I.S.U. Publications.
19. PULPWOOD: A NEW MARKET FOR IOWA TREES; FS990. I.S.U. Publications.
20. LIFE IN A LOG; WL27. I.S.U. Publications.
21. GROWING BLACK WALNUT IN IOWA; Pm426. I.S.U. Publications.
22. TREE PLANTING IN IOWA; Pm496. I.S.U. Publications.
23. HOW TO PLANT TREES; Pm530. I.S.U. Publications.
24. MANAGING THE FAMILY FOREST; No. 2187. U.S.D.A. Office of Information.

Land Use Planning

1. MODERN INCINERATION: A SOLUTION-NOT THE ANSWER; Incineration Institute of America.
2. MAP OF COAL AREA IN THE UNITED STATES; National Coal Association.
3. COAL; National Coal Association.

4. SWINE WASTE MANAGEMENT - folder; I.S.U. Department of Agricultural Education.
5. SOLID WASTE MANAGEMENT; Magazine. R.R.J. Publishing Company.
6. SANITARY LANDFILL; 2nd Edition. John Deere, Inc.
7. SANITARY LANDFILL FACTS; No. 1792. U.S. Government Printing Office.
8. FARMSTEAD SEWAGE & REFUSE DISPOSAL; AB274. U.S.D.A. Office of Information. 1963.
9. THE WAY & HOW TO RURAL ZONING; AB196. U.S.D.A. Office of Information. 1967.
10. ZONING FOR RURAL AREAS; L510. U.S.D.A. Office of Information. 1970.
11. SOILS & SEPTIC TANKS; AB349. U.S.D.A. Office of Information. 1971.
12. RESTORING SURFACE-MINED LAND; M1082. U.S.D.A. Office of Information. 1968.

Outdoor Recreation Planning

1. RECREATION IN SMALL WATERSHED PROJECTS; PA610. U.S. Soil Conservation Service.
2. RURAL RECREATION ENTERPRISES FOR PROFIT; No. 277. U.S.D.A. Office of Information.
3. RURAL RECREATION; No. 930. U.S.D.A. Office of Information.
4. RURAL RECREATION ENTERPRISES; FS1296. I.S.U. Publications.
5. CAMPING; PA5[illegible] U.S.D.A. Office of Information.
6. HOW DO IOWANS [illegible]E THEIR LAKES FOR RECREATION?; FS13[illegible]. I.S.U. Publications.
7. DEVELOPING WATER AREAS FOR OUTDOOR RECREATIONS; FS1365. I.S.U. Publications.
8. SHORT CUTS TO MAKING AN ACCURATE SCALES MAP; LA188. I.S.U. Publications.
9. OUTDOOR RECREATION ENTERPRISES A NEW SOURCE OF INCOME IN IOWA; FS1194. I.S.U. Publications.
10. USING IOWA'S PRAIRIE SPECIES TO FIGHT ROADSIDE WEEDS; FS1285. I.S.U. Publications.
11. THE QUALITY OF OUTDOOR RECREATION: AS EVIDENCED BY USER SATISFACTION; Superintendent of Documents.
12. OUTDOOR RECREATION OF AMERICA; Superintendent of Documents.
13. MANUAL OF OUTDOOR CONSERVATION EDUCATION; National Audubon Society.
14. OUTDOOR LIVING; MWPS-12. University of Illinois.
15. OUTDOOR LIVING: PLANNING & CONSTRUCTION GUIDE; Cornell University.
16. MAKE YOUR FARM POND SAFE - PREVENT DROWNINGS; PA396. U.S.D.A. Office of Information. 1971.
17. PONDS FOR WATER SUPPLY & RECREATIONAL; AH387. U.S.D.A. Office of Information. 1971.
18. MORE HUNTING, FISHING & HIKING SPACE; PA793. U.S.D.A. Office of Information. 1967.

Soil Conservation

1. CONTROLLING EROSION ON CONSTRUCTION SITES; No. 347. Soil Conservation Service.

2. SEDIMENTS: ITS FILLING HARBORS, LAKES & ROADSIDE DITCHES: S.C.S.
3. GRASS WATERWAYS; No. 4021. Illinois Vocational Agriculture Service.
4. CONTOURING; No. 4036. Illinois Vocational Agriculture Service.
5. TERRACING; No. 4038. Illinois Vocational Agriculture Service.
6. SOIL CONSERVATION SERVICE; PA818. S.C.S.
7. ASSISTANCE AVAILABLE FROM THE SOIL CONSERVATION SERVICE; No. 345. U.S. Government Printing Office.
8. HOW TO CONTROL A GULLY; No. 2171. U.S. Government Printing Office.
9. MULCH TILLAGE IN MODERN FARMING; U.S. Government Printing Office.
10. SOIL & WATER CONSERVATION: WHAT, WHY & HOW; Ohio State University.
11. DEFINING SOIL & WATERSHED; Ohio State University.
12. WHAT ARE THE RESPONSIBILITIES OF A SOIL & WATER DISTRICT EMPLOYEE; Ohio State University.
13. SURVEYING; Ohio State University.
14. ENGINEERING CONSTRUCTION STRUCTURES & PRACTICES; Ohio State University.
15. GRASS WATERWAYS & TERRACE OUTLETS; Pm 166. I.S.U. Publications.
16. WINDBREAKS FOR CONSERVATION; No. 339. S.C.S.
17. TO SAVE THE EARTH; National Wildlife Federation.
18. THE MEASURE OF OUR LAND; PA128. S.C.S.
19. LAND IN A NEW LIGHT; C2. Cornell University.
20. KNOW YOUR SOIL; AB267. U.S.D.A. Office of Information. 1970.
21. SOIL CONSTRUCTION DISTRICT: WHAT THEY ARE, HOW THEY WORK, HOW SCS HELPS THEM; PA417. U.S.D.A. Office of Information. 1968.
22. SOIL EROSION....THE WORK OF UNCONTROLLED WATER; AB260. U.S.D.A. Office of Information.
23. GRASS WATERWAYS IN SOIL CONSERVATION; L477. U.S.D.A. Office of Information.

Water Resource Management

1. CLEAN WATER: IT'S UP TO YOU; Izakk Walton League of America.
2. WHAT YOU CAN DO ABOUT WATER POLLUTION; Environmental Protection Agency.
3. WATER POLLUTION CONTROL - PROGRESS REPORT; Iowa Water Pollution Control Commission.
4. CONSERVATION & THE WATER CYCLE; No. 326. S.C.S.
5. UNTREATED SEWAGE: A COMMUNITY MENACE; Portland Cement Association.
6. A NEW PROCESS FOR TREATING WASTEWATER; PHYSICAL-CHEMICAL TREATMENT; Environmental Protection Agency.
7. A NEW PROCESS FOR TREATING WASTEWATER: PHOSPHORUS REMOVAL; Environmental Protection Agency.
8. UPGRADING EXISTING WASTEWATER TREATMENT FACILITIES; Environmental Protection Agency.
9. SOILS SUITABLE FOR SEPTIC TANK FILTER FIELDS; No. 243. S.C.S.
10. A PRIMER ON WASTE WATER TREATMENT; Water Pollution Control Federation.
11. CONTROLLING PLANT & ANIMAL PESTS IN FARM PONDS WITH COPPER SULFATE; Phelps Dodge Refining Corporation.
12. WHAT YOU CAN TO ABOUT WATER POLLUTION; U.S.D.I.

13. SOME ASPECTS OF WATER RESOURCE DEVELOPMENT; C1. Cornell University.
14. CONSERVATION & THE WATER CYCLE; AB326. U.S.D.A. Office of Information. 1967.
15. PONDS FOR WATER SUPPLY & RECREATION; AH387. U.S.D.A. Office of Information. 1971.

Wildlife Management

1. ENDANGERED SPECIES; National Wildlife Federation.
2. PRINCIPLES OF GAME MANAGEMENT; C26. Cornell University.
3. MAKE LAND PRODUCE USEFUL WILDLIFE; F2035. U.S.D.A. Office of Information. 1969.
4. MORE WILDLIFE THROUGH SOIL & WATER CONSERVATION; AB175. U.D.S.A. Office of Information.
5. PONDS & MARSHES FOR WILD DUCKS ON FARM & RANCHES IN THE NORTHERN PLAINS; F2234. U.S.D.A. Office of Information. 1968.
6. WILDLIFE OF TOMORROW; PA989. U.S.D.A. Office of Information. 1972.
7. WILDLIFE, THE ENVIRONMENTAL BAROMETER; Wildlife Management Institute.
8. AUTUMN OLIVE FOR WILDLIFE & OTHER CONSERVATION USES; U.S.D.A. Superintendent of Documents.
9. WILDLIFE OF FOREST & RANGELANDS; National Wildlife Federation.
10. WILDLIFE OF STREAMS, LAKES & RIVERS; National Wildlife Federation.
11. WILDLIFE OF FARM & FIELD; National Wildlife Federation.
12. THE FARMER & WILDLIFE; Wildlife Management Institute.
13. ROLE OF HABITAT IN THE DISTRIBUTION & ABUNDANCE OF MARSH BIRDS; SR43. I.S.U. Publications.
14. THE RUFFED GROUSE; FS1292. I.S.U. Publications.
15. IOWA BIRD MIGRATION CALENDAR; WL32. I.S.U. Publications.
16. IMPROVING HOME GROUNDS FOR BIRDS & ANIMALS; WL35. I.S.U. Publications.
17. IT'S FAWNING TIME AGAIN; FS9657. I.S.U. Publications.
18. WHAT'S IN THAT MARSH?; FS965. I.S.U. Publications.
19. SIGNS OF GOOD HUNTING & FISHING; Program Aid 1012. S.C.S.
20. A PEEK AT WILDLIFE; State Conservation Commission.
21. WILDLIFE, A MEASURE OF OUR ENVIRONMENT; PA965. U.S.D.A. of Information.
22. BY WHICH WE LIVE; National Wildlife Federation.
23. INVITE BIRDS TO YOUR HOME; PA982. Superintendent of Documents.

Books:

1. CAREER EDUCATION IN THE NATURAL RESOURCES: A SUGGESTED HIGH SCHOOL CURRICULUM GUIDE; U.S. Office of Education.
2. NATURAL RESOURCES & ENVIRONMENTAL AWARENESS: A TEACHER'S GUIDE FOR GRADES K-6; U.S. Office of Education.
3. EXPLORING OCCUPATIONS IN NATURAL RESOURCES: A RESOURCE GUIDE FOR GRADES 7-8-9-; U.S. Office of Education.
4. NATURAL RESOURCES TECHNOLOGIES: A SUGGESTED POST HIGH SCHOOL PROGRAM DEVELOPMENT GUIDE; U.S. Office of Education.
5. OUR NATURAL RESOURCES; McHall & Kircher. Interstate. 1970.

6. YOUR ENVIRONMENT: AIR, AIR POLLUTION & WEATHER; Henson. Interstate. 1971.
7. ENVIRONMENT CONSERVATION; Dasman. John Wiley & Son, Son.
8. EROSION & SEDIMENT POLLUTION CONTROL; Beasley. I.S.U. Press.
9. OUTDOOR U.S.A.; Yearbook of Agriculture. 1967. U.S. Government Printing Office.
10. POLLUTION PRIMER; National Tuberculosis & Respiratory Disease Association.
11. RURAL RECREATION FOR PROFIT; Smith, Partain & Champlin. Interstate.
12. FOREST & FORESTRY; Anderson & Smith. Interstate.
13. APPROVED PRACTICES IN SOIL CONSERVATION; Foster. Interstate.
14. AGRICULTURE RESOURCES & FORESTRY; Curtis, Vogler & Wright. Interstate.
15. UNDERSTANDING ECOLOGY; J. Weston Walch.
16. TOO MANY PEOPLE; J. Weston Walch. 1971.
17. AIR POLLUTION EXPERIMENTS FOR JUNIORS & SENIOR HIGH SCHOOL SCIENCE CLASSES; Air Pollution Control Association. 1972.
18. MUNICIPAL REFUSE DISPOSAL; American Public Works Association.
19. INTRODUCTION TO ENVIRONMENTAL PROTECTION; Ohio State University.
20. WATER SUPPLY & WASTE DISPOSAL; Hardenbergh & Rodie. International Textbook Company. 1961.
21. WATER & WASTE; Stephans. St. Martin Press. 1967.
22. THE SOIL CONSERVATION STORY; Allis-Chalmers Mfg. Company.
23. A PRIMER ON AGRICULTURE POLLUTION; Soil Conservation Society of America.
24. ENVIRONMENTAL QUALITY & THE CITIZEN; Soil Conservation Society of America.
25. GUIDELINES TO CONSERVATION EDUCATION ACTION; Izaak Walton League of America.
26. BUILD OUR AMERICAN COMMUNITIES; 0-387-949. U.S.D.A. 1970.
27. CONSERVATION TOOLS FOR EDUCATION; Conservation Education Office.
28. AGRICULTURE PRACTICES & WATER QUALITY; Willrich & Smith. I.S.U. Press.
29. FORESTRY & ITS CAREER OPPORTUNITIES; Shirley, Hardy. McGraw-Hill.
30. DEVELOPING FARM WOODLANDS; Preston. McGraw-Hill.
31. FORESTRY & FARM MANAGEMENT; Westveld, Peck. Wiley & Sons, Inc.
32. PHEASANTS IN NORTH AMERICA; Allen. Stackpole Books.
33. E.P. THE NEW CONSERVATION; Griffith, Landin & Jostad. Izaak Walton League of America.
34. RECREATIONAL USE OF WILD LAND; Brockman & Frank. McGraw-Hill. 1973.
35. ELEMENTS OF OUTDOOR RECREATION PLANNING; Driver. School of Natural Resources, University of Michigan.
36. A FIELD GUIDE TO THE MANUALS; Grossenheider. National Audubon Society.
37. FAMILIES OF BIRDS; Weston Publishing Company, Inc.
38. MANAGEMENT OF ARTIFICIAL LAKES & PONDS; Bennett, George & Van Nostrand. I.S.U. Book Store.
39. IOWA FISH & FISHING; Iowa Conservation Commission.
40. MAMMALS OF MISSOURI; Schwartz. University of Missouri or I.S.U. Book Store.
41. TIMBER! PROBLEMS, PROSPECTS, POLICIES; William Dverr. I.S.U. Press.

42. WATER POLLUTION CONTROL & ABATEMENT; Willrich & Hanes. I.S.U. Press.

SOURCES OF REFERENCES AND INSTRUCTIONAL AIDS

1. Agricultural Stabilization and Conservation Service
(see local county office)

2. Air Pollution Control Commission
4400 5th Avenue
Pittsburg, Pennsylvania 15213

3. Allis-Chalmers Mfg. Company
Construction Machinery Division
Milwaukee, Wisconsin 53201

4. Aluminum Association
750 3rd Avenue
New York, New York 10017

5. American Fisheries Society
1040 Washington Building
15th Street and New York Avenue, N.W.
Washington, D.C. 20005

6. American Petroleum Institute
Committee on Public Affairs
1271 Avenue of the Americas
New York, New York 10020

7. American Public Works Association
1313 East 60th Street
Chicago. Illinois 60637

8. American Pulpwood Association
605 3rd Avenue
New York, New York 10016

9. American Water Works Association
2 Park Avenue
New York, New York 10016

10. Associate Films, Inc.
Regional Film Center
561 Hillgrave Avenue
LaGrand, Illinois 60525

11. Bay's Branch Wildlife Refuge
Guthrie Center, Iowa 50115

12. Bureau of Audio Visual Instruction
1327 University Avenue
P.O. Box 2093
Madison, Wisconsin 53715

13. California Polytechnic State University
Vocational Education Production
San Luis Obispo, California 93401

14. Colorado Mining Association
402 Majestic Building
290 South 16th Street
Denver, Colorado 80202

15. Conservation Education Officer
U.S. Forest Service
P.O. Box 3623
Portland, Oregon 97208

16. Cornell University
Instructional Materials Services
Department of Education
Room 201, Stone Hall
Ithaca, New York 14850

17. Coronet Instructional Materials
65 East South Street
Chicago, Illinois 60601

18. Department of Environmental Quality
Lucas State Office Building
Des Moines, Iowa 50319

19. Environmental Protection Agency
Technology Transfer
Washington, D.C. 20460

20. Farmland Industries
Department 37
P.O. Box 7305
Kansas City, Missouri 64016

21. Hach Chemical Company
P.O. Box 907
Ames, Iowa 50010

22. Illinois Environmental Protection Agency
Division of Noise Pollution Control
2200 Churchill Road
Springfield, Illinois 62706

23. Illinois, University of
Visual Aids Service
Division University Extension
Champaign, Illinois 61820

24. Illinois, University of
Vocational Agriculture Service
College of Agriculture
Urbana, Illinois 61820

25. Incinerator Insitute of America
60 East 42nd Street
New York, New York 10017

26. IAVIM Center
Attention: Thomas A. Hoerner
Agricultural Engineering Department
Iowa State University
Ames, Iowa 50010

27. International Textbook Company
Scranton, Pennsylvania 18501

28. Interstate Printers and Publishers, Inc.
Danville, Illinois 61832

29. Iowa Conservation Commission
State Office Building
300 4th Street
Des Moines, Iowa 50319

30. Iowa Ornithologists' Union
2314 Helmer Street
Sioux City, Iowa 51103

31. Iowa State University
Department of Agricultural Education
223 Curtiss Hall
Ames, Iowa 51101

32. Iowa State University
Civil Engineering Department
394 Town Engineering Building
Ames, Iowa 50010

33. Iowa State University
Extension Forestry
253 Bessey Hall
Ames, Iowa 50010

34. Iowa State University
Media Resources Center
121 Pearson Hall
Ames, Iowa 50010

35. Iowa State University
Dr. Robert Moorman
Extension Wildlifer
Science Building
Ames, Iowa 50010

36. Iowa State University
Mr. Burl Parks
Landscape Architecture
Ames, Iowa 50010

37. Iowa State University
Publications Distribution Center
Printing and Publications Building
Ames, Iowa 50010

38. Iowa State University
Press Building
Ames, Iowa 50010

39. Iowa Water Pollution Control Commission
State Department of Health
Box 344
Clear Lake, Iowa 50428

40. Izaak Walton League of America
1326 Waukegon Road
Glenview, Illinois 60025

41. John Deere, Inc.
Moline, Illinois 61265

42. John Hall Film Service
1923 West Atkinson Street
Milwaukee, Wisconsin 53212

43. J. Weston Walch
Portland, Maine 04104

44. Kent Feed, Inc.
Education Department
Muscatine, Iowa 52761

45. Maryland State Department of Education
Department of Vocational-Technical Education
P.O. Box 8718
Friendship International Airport
Baltimore, Maryland 21240

46. 3 M Company
Education Services
Box 3100
St. Paul, Minnesota 55101

47. McGraw-Hill Book Company
1221 Avenue of the Americas
New York, New York 10020

48. Missouri Water Pollution Board
P.O. Box 154
Jefferson City, Missouri 65100

49. Modern Talking Picture Service
200 3rd Avenue, S.W.
Cedar Rapids, Iowa 52406

50. National Association of Conservation Districts
Environment Film Service
P.O. Box 855
League City, Texas 77573

51. National Audubon Society
950 3rd Avenue
New York, New York 10022

52. National Coal Association
Coal Building
1130 17th Street, N.W.
Washington, D.C. 20005

53. National Medical Audio-Visual Center
Station K
Atlanta, Georgia 30324

54. National Particleboard Association
711 14th Street, N.W.
Washington, D.C. 20005

55. National Wildlife Federation
Education Service Section
1412 16th Street, N.W.
Washington, D.C. 20036

56. North Carolina Department of Public Instruction
Raleigh, North Carolina 27601

57. Oklahoma Department of Vocational-Technical Education
Stillwater, Oklahoma 74074

58. Olin Mathieson Chemical Corporation
East Alton, Illinois 62024

59. Ohio State University
Agricultural Education Curriculum Materials Service
Room 201, 2120 Fytte Road
Columbus, Ohio 43210

60. Phelps Dodge Refining Corporation
300 Park Avenue
New York, New York 10022

61. Portland Cement Association
33 West Grand Avenue
Chicago 10, Illinois 60610

62. R.R.J. Publishing Corporation
150 East 52nd Street
New York, New York 10022

63. Shell Film Library
450 North Meridian Street
Indianapolis, Indiana 46204

64. Soil Conservation Service
823 Federal Building
Des Moines, Iowa 50309

65. Springbrook Conservation Education Center
Curt Powell, Director
Guthrie Center, Iowa 50115

66. Soil Conservation Society of America, Inc.
7515 N.E. Ankeny Road
Ankeny, Iowa 50021

67. StackPole Books
Cameron & Kelker Streets
Harrisburg, Pennsylvania 17105

68. Standard Oil Division
American Oil Company
Farm & Home Department
Box 4040
St. Paul, Minnesota 55116

69. Statistical Reporting Service
Agricultural Statistician
Federal Building Room 855
210 Walnut Street
Des Moines, Iowa 50309

70. St. Martins Press
175 Fifth Avenue
New York, New York 10010

71. Successful Farming
Reader Service
Des Moines, Iowa 50309

72. Texas A & M University
Vocational Instructional Service
F.E. Box 182
College Station, Texas 77843

73. Tuberculosis & Respiratory Disease Association
(see local medical people)

74. U.S. Department of Agriculture
Motion Picture Service
Office of Information
Washington, D.C. 20250

75. U.S. Department of Agriculture
Office of Information
Washington, D.C. 20250

76. U.S. Department of Agriculture
Photograph Division
Office of Information
Washington, D.C. 20250

77. U.S. Department of Interior
Federal Water Pollution Control Administration
U.S. Government Printing Office
Washington, D.C. 20250

78. U.S. Government Printing Office
Superintendent of Documents
Washington, D.C. 20402

79. Water Pollution Control Federation
3900 Wisconsin Avenue
Washington, D.C. 20016

80. Weston Publishing Company, Inc.
Racine, Wisconsin 53401

81. Wildlife Management Institute
709 Wire Building
Washington, D.C. 20005

82. Wildlife Society
Suite S-176
3900 Wisconsin Avenue, N.W.
Washington, D.C. 20016

83. Wiley & Son, Inc.
605 Third Avenue
New York, New York 10016

84. Wisconsin, University of
Department of Natural Resources
208 Agriculture Hall
Madison, Wisconsin 53701

85. Bulletin Room
Extension Building
South Dakota State University
Brookings, South Dakota 57006

SUPPORTING AREAS OF INSTRUCTION

1. Supervised Occupation Experience

Example Performance Objectives:

1. The student will be able to identify productive, improvement and supplementary projects and explain the difference between the types of projects. The student will demonstrate the above by developing a list of ten productive enterprises, five improvement practices and five supplementary practices.

2. The student will survey the local community to identify possible occupational opportunities by administering a model survey.

Content Outline:

I. Conducting Supervised Occupational Experience Programs

A. Concept of supervised occupational experience

B. Responsibilities of student, instructor, employer, school

C. Labor laws

D. Training plans

E. Training sites

F. Training agreements

II. Selecting Supervised Occupational Experience Program

A. Options open for occupational experience

1. Entrepreneurship
2. Cooperative work experience
3. Laboratory or/and land laboratory

B. Personal preference

C. Occupational goals

D. Approved practices

E. Supplementary practices

F. Improvement activities

III. Keeping Financial and Experience Records

A. Net worth statement

B. Enterprise analysis

C. Placement (work) experience records

D. Efficiency factors

E. Greenhand, Chapter Farmer, State Farmer, American Farmer applications

F. Proficiency award applications

G. Budgeting

Suggested Source Materials:

Bulletins

1. ADVERTISING AND PROMOTION, Student Manual, Ohio Agricultural Education Curriculum Materials Service.
2. ADVERTISING AND PROMOTION, Teacher's Guide, Ohio Agricultural Education Curriculum Materials Service.
3. AGRICULTURAL BUSINESS PROCEDURES, Illinois Vo-Ag Service, (40¢)
4. AGRICULTURAL SUPPLIES, AND SERVICE, Teacher's Guide, Ohio Agricultural Education Curriculum Materials Service.
5. AGRICULTURE, MORE THAN FARMING, CAREERS UNLIMITED, Future Farmers Supply Service.
6. AGRICULTURAL WORK EXPERIENCE, 1971, Theodore Shannon, Ohio Agricultural Education Curriculum Materials Service.
7. ALCOA INFORMATION AIDS CATALOG, Aluminum Company of America.
8. APPLYING FOR A JOB, Illinois Vo-Ag Service.
9. APPLICATION FOR A CERTIFICATE TO EMPLOY A STUDENT LEARNER, Form WH-205, Bureau of Labor, Des Moines, Iowa.
10. BETTER COMMUNICATIONS IN SMALL BUSINESSES, SBA 1.12:7, Small Business Administration.
11. BRINGING TOGETHER IOWA YOUTH AND AGRIBUSINESS, Dr. Louis Thompson, Associate Dean of Agriculture, College of Agriculture, Iowa State University.
12. BUDGETING AND SPENDING, Ohio Agricultural Education Curriculum Materials Service. (30¢)
13. BUILDING AN INSURANCE PROGRAM, Ohio Agricultural Education Curriculum Materials Service.
14. BUSINESS MONEY MANAGEMENT, Student Manual, Ohio Agricultural Education Curriculum Materials Service.
15. BUSINESS MONEY MANAGEMENT, Teacher's Guide, Ohio Agricultural Education Curriculum Materials Service.
16. BUSINESS PROCEDURES AND RECORDS, Student Manual, Ohio Agricultural Education Curriculum Materials Service.
17. BUSINESS PROCEDURES AND RECORDS, Teacher's Guide, Ohio Agricultural Education Curriculum Materials Service.
18. CATALOG OF LITERATURE, Aluminum Company of America.
19. CHOOSE YOUR CAREER IN AGRICULTURE, 1960, Hoard's Dairyman.
20. CREDIT, Ohio Agricultural Education Curriculum Materials Service.

21. DECIDING ON AND LOCATING YOUR KIND OF JOB, Ohio Agricultural Education Curriculum Materials Service. (30¢)
22. EDUCATION COOPERATION ACTIVITIES AND SERVICES OF AMERICAN IRON AND STEEL INSTITUTE CATALOG, American Iron and Steel Institute.
23. EMPLOYMENT OF STUDENT LEARNERS, WHPC Publication 1122, Bureau of Labor, Des Moines, Iowa.
24. EXPLORING CAREERS IN AGRICULTURE, 1963, Pennsylvania State University.
25. FAIR LABOR STANDARDS ACT OF 1938, as amended, WHPC Publication 1000, Bureau of Labor, Des Moines, Iowa.
26. FARMERS AND AGRICULTURE IN OUR ECONOMY, Illinois Vo-Ag Service.
27. FILMS AND FILMSTRIPS CATALOG, American Iron and Steel Institute.
28. GETTING ALONG ON YOUR JOB, Ohio Agricultural Education Curriculum Materials Service.
29. GETTING STARTED ON YOUR JOB, Ohio Agricultural Education Curriculum Materials Service. (30¢)
30. GETTING YOUR JOB, Ohio Agricultural Education Curriculum Materials Service. (30¢)
31. GUIDELINES AND PROCEDURES: DIRECTED WORK-EXPERIENCE PROGRAMS IN VOCATIONAL AGRICULTURAL EDUCATION, Cornell University.
32. A GUIDE TO CHILD-LABOR PROVISIONS OF THE FAIR LABOR STANDARDS ACT, WHPC Publication 1096, Child Labor Bulletin No. 101, Bureau of Labor, Des Moines, Iowa.
33. HUMAN RELATIONS IN AGRI-BUSINESS (UNIT 3), Clark, et al, Michigan Association of Teachers of Vocational Agriculture Services Committee.
34. HUMAN RELATIONS IN AGRICULTURAL BUSINESS, Illinois Vo-Ag Service. (15¢)
35. HUMAN RELATIONS IN AGRICULTURAL OCCUPATIONS, Ohio Agricultural Education Curriculum Materials Service.
36. HUMAN RELATIONS IN BUSINESS, Student Manual, Ohio Agricultural Education Curriculum Materials Service.
37. HUMAN RELATIONS IN BUSINESS, Teacher's Guide, Ohio Agricultural Education Curriculum Materials Service.
38. HOW FARMERS CONTRIBUTE TO AMERICAN'S PROSPERITY, A.O. Smith Harvestore Products, Inc.
39. HOW'RE THEY REALLY DOING DOWN ON THE FARM, New Holland Farm Equipment Company.
40. IOWA, WHERE INDUSTRY AND AGRICULTURE MEET, Des Moines Register and Tribune.
41. KEEPING RECORDS OF THE SUPERVISED FARMING PROGRAM, Illinois Vo-Ag Service.
42. KEEPING YOUR RECORDS STRAIGHT, Ohio Agricultural Education Curriculum Materials Service, (30¢)
43. MARKETING AGRICULTURAL PRODUCTS, Student Manual, Ohio Agricultural Education Curriculum Materials Service.
44. MARKETING AGRICULTURAL PRODUCTS, Teacher's Guide, Ohio Agricultural Education Curriculum Materials Service.
45. MOTION PICTURES (catalog), United States Steel Corporation.
46. OPPORTUNITIES IN AGRICULTURAL OCCUPATIONS AND THE EMPLOYEE WITHIN THE BUSINESS ORGANIZATION, Student Manual, Ohio Agricultural Education Curriculum Materials Service.

47. OPPORTUNITIES IN AGRICULTURAL OCCUPATIONS AND THE EMPLOYEE WITHIN THE BUSINESS ORGANIZATION, Teacher's Guide, Ohio Agricultural Education Curriculum Materials Service.
48. PLANNING FOR A CAREER IN AGRICULTURE, Student Handbook, Pennsylvania State University.
49. PLANNING FOR A CAREER IN AGRICULTURE, Teacher's Guide, Pennsylvania State University.
50. PERSONALITY AND SUCCESS, SBA 1.20:4, Small Business Administration.
51. PERSONNEL MANAGEMENT GUIDES FOR SMALL BUSINESS, SBA 1.12:26, Small Business Administration.
52. PROFIT IS WHERE YOU FIND IT, New Idea Company. (filmstrip & record)
53. READING LIST OF PUBLICATIONS AND CATALOG OF VISUAL AIDS, United States Steel Corporation.
54. REFERENCE AND AUDIO-VISUAL MATERIALS ON IRON AND STEEL CATALOG, American Iron and Steel Institute.
55. SALESMANSHIP IN AGRICULTURAL BUSINESS, Illinois Vo-Ag Service.
56. SAVINGS AND CHECKING ACCOUNTS, Ohio Agricultural Education Curriculum Materials Services. (30¢)
57. SELLING AND SALESMANSHIP, Student Manual, Ohio Agricultural Education Curriculum Materials Services.
58. SELLING AND SALESMANSHIP, Teacher's Guide, Ohio Agricultural Education Materials Services.
59. SHOULD YOU GO INTO AGRICULTURE, New York Life Insurance Company.
60. SIMPLIFYING WORK IN AN AGRICULTURAL BUSINESS, Illinois Vo-Ag Service. (35¢)
61. STARTING AND MANAGING A SMALL BUSINESS OF YOUR OWN, SBA 1.15:1, Small Business Administration.
62. TAKING CARE OF YOURSELF, Ohio Agricultural Education Curriculum Materials Service. (30¢)
63. THERE'S A NEW CHALLENGE IN AGRICULTURE, Dr. Louis Thompson, Iowa State University.
64. THE USE OF THE CASH REGISTER, Illinois Vo-Ag Service. (10¢)

Books:

1. THE ART AND SKILL OF GETTING ALONG WITH PEOPLE, Duvall, Sylvanus M., Prentice-Hall, Inc.
2. CAREERS IN AGRIBUSINESS AND INDUSTRY, Stone, A.A., The Interstate Printers and Publishers.
3. ESSENTIAL ASPECTS OF CAREER PLANNING AND DEVELOPMENT, Atherton-Mumphrey, 1969, The Interstate Printers and Publishers.
4. EXPERIENCE PROGRAMS FOR LEARNING VOCATIONS IN AGRICULTURE, Binkley-Hammonds, 1970, The Interstate Printers and Publishers.
5. HANDBOOK ON AGRICULTURAL EDUCATION IN PUBLIC SCHOOLS, Lloyd J. Phipps, 1970, The Interstate Printers and Publishers.
6. HANDBOOK OF AGRICULTURAL OCCUPATIONS, Hoover, 1969, The Interstate Printers and Publishers.
7. HOW TO WIN FRIENDS AND INFLUENCE PEOPLE, Carnegie, Dale, Pocket Books, Inc.
8. AN INTRODUCTION TO AGRICULTURAL BUSINESS AND INDUSTRY, Weyant, Hoover, McClay, 1965, The Interstate Printers and Publishers.

9. SUCCEEDING IN THE WORLD OF WORK, Kimbrell-Vinegard, 1970, McKnight and McKnight Publishing House.
10. TEACHING TAXES, Internal Revenue Service.

SOURCES OF REFERENCES AND INSTRUCTIONAL AIDS

1. Aluminum Company of America
   1254 Alcoa Building
   Pittsburg, Pennsylvania 15219

2. American Iron and Steel Institute
   150 East 42nd Street
   New York, New York 10017

3. A. O. Smith Harvestore Products, Inc.
   Contact local dealer

4. Clemson University
   Vocational Education Media Center
   Clemson, South Carolina 29631

5. Cornell University
   University Press
   124 Roberts Place
   Ithaca, New York 14850

6. CUNA Mutual Insurance Society
   Scholastic Program
   Box 391
   Madison, Wisconsin 53706

7. Des Moines Register and Tribune
   Des Moines, Iowa 50309

8. Dr. Louis Thompson
   Associate Dean of Agricultural, College of Agriculture
   Iowa State University
   Ames, Iowa 50010

9. Farmland Industries
   P.O. Box 7305
   Kansas City, Missouri 64116

10. Future Farmer's Supply Service
    Box 15130
    Alexandria, Virginia 22309

11. Hoard's Dairyman
    Ft. Atkinson, Wisconsin 53538

12. Internal Revenue Service
    Kansas City, Missouri 64106

13. The Interstate Printers and Publishers
1927 North Jackson Street
Danville, Illinois 61832

14. Iowa Grain and Feed Association
201 Shops Building
Des Moines, Iowa 50309

15. IAVIM Center
Attention: Thomas A. Hoerner
Agricultural Engineering Department
Iowa State University
Ames, Iowa 50010

16. Iowa State University Media Resources Center
121 Pearson Hall
Iowa State University
Ames, Iowa 50010

17. Kent Feeds, Inc.
Education Department
Muscatine, Iowa 52761

18. The Labor Commissioner
Bureau of Labor
State House
Des Moines, Iowa 50319

19. McKnight and McKnight Publishing House
Box 854
Bloomington, Illinois 61701

20. Michigan Association of Teachers of Vocational Agriculture
Services Committee
Educational Services
Michigan State University
East Lansing, Michigan 48823

21. New Holland Farm Equipment Company
Contact local dealer

22. New Idea Company
Public Relations Department
AVCO New Idea Farm Equipment Division
Coldwater, Ohio 45828

23. New York Life Insurance Company
51 Madison Avenue
New York, New York 10010

24. Ohio Agricultural Education Curriculum Materials Services
Room 201
2120 Fyffe Road
Columbus, Ohio 43210

25. Pennsylvania State University
Department of Agricultural Education
University Park, Pennsylvania 16802

26. Pocket Books, Inc.
1 West 39th Street
New York, New York 10018

27. Prentice-Hall, Inc.
Education Division
Englewood Cliffs, New Jersey

28. Ralston-Purina Company
St. Louis, Missouri 63199

29. Small Business Administration
New Federal Building
210 Walnut Street
Des Moines, Iowa 50309

30. Toastmasters International
P.O. Box 10400
Santa Ana, California 92711

31. United States Steel Corporation
Director of Public Relations
71 Broadway
New York, New York 10006

32. University of Illinois
Visual Aids Service
Division of University Extension
Champaign, Illinois 61820

33. University of Illinois
Vo-Ag Service
University of Illinois at Urbana Champaign

34. University of Missouri
Instructional Materials Laboratory
8 Industrial Education Building
University of Missouri-Columbia
Columbia, Missouri 65201

35. University of Wisconsin
Instructional Material Center
Madison, Wisconsin 53706

2. Future Farmers of America

Example Performance Objectives:

1. The FFA Chapter officers will complete, from memory, the opening and closing ceremonies at all regular FFA meetings in accordance with the FFA Manual.

2. The students will conduct the business meeting according to accepted procedures as set forth in Robert's Rules of Order and to a level of attainment as determined by the instructor.

3. The student will develop sufficient skill to participate at least once during his FFA membership in one of the FFA Proficiency Awards or contest areas at the state level.

Content Outline:

I. FFA as a part of Vo-Ag

II. FFA Organization

A. National, state and local - origin, development and structure

B. Degrees and kinds of membership

C. Emblem, colors and paraphernalia

D. Motto, creed and response

E. Purposes

F. Conduct and dress

III. National Activities

A. National convention

B. National FFA supply services, magazines and calendars

C. Work experience abroad

D. FFA Foundation, Inc.

E. National Leadership Conference

F. BOAC

IV. State Activities

A. State convention

B. State FFA Newsletter

C. S. D. FFA Foundation, Inc.

D. BOSDC

E. State leadership camp

F. State fair activities

V. Chapter Operation

A. Eight essentials

B. Duties and responsibilities of officers and members

C. Parliamentary Procedure

D. Program of activities

E. Ceremonies

F. Meeting room organization

G. Leadership development

VI. Alumni Association (local, state and national)

VII. Contests Awards and Recognition

A. Proficiency awards (examples)

1. Crop production
2. Placement in sales and/or service
3. Agricultural mechanics
4. Oranamental horticulture

B. Educational contests (examples)

1. Dairy products judging
2. Speaking contest
3. Livestock judging
4. Poultry judging
5. Ag mechanics

C. National chapter awards

D. National chapter safety awards

E. Degree advancement

F. BOAC

G. Educational activities sponsored by other agencies

1. Loan program

2. Scholarships
3. Schools
4. Recognition awards
5. Locally sponsored activities
6. Other competitive activities

Suggested Source Materials:

Books:

1. A MORE EFFECTIVE FFA, Wall, Interstate Printers and Publishers, Danviile, Illinois.
2. FORWARD FFA, W. A. Ross, National FFA Supply Service, Alexandria, Virginia.
3. HANDBOOK ON SPEECH FOR FUTURE FARMERS, R. D. Purkey, Interstate Printers and Publishers, Danville, Illinois.
4. HOW TO HOLD A BETTER MEETING, Frank Snell, Harper and Brothers, New York, New York.
5. HOW TO IMPROVE YOUR PERSONALITY, Roy Newton, McGraw-Hill Book Company, Inc., New Yorl, New York.
6. HOW TO SPEAK AND WRITE FOR RURAL AUDIENCES, H. L. Cosline, Interstate Printers and Publishers, Danville, Illinois.
7. I DARE YOU, Danforth, Ralston Pruina, St. Louis, Missouri.
8. LEADERSHIP TRAINING AND PARLIAMENTARY PROCEDURE FOR FFA, Gray and Jackson, Prentice Hall, Englewood Cliffs, New Jersey.
9. LIVE AND LEARN, E. R. Eastman, Interstate Printers and Publishers, Danville, Illinois.
10. PARLIAMENTARY PROCEDURE, Alice F. Sturgis, McGraw-Hill Book Company, Inc., New York, New York.
11. PRACTICAL PARLIAMENTARY PROCEDURE, R. M. Cruzan, McKnight and McKnight, Bloomington, Illinois.
12. PUBLIC SPEAKING FOR FUTURE FARMERS, L. S. Judson, Interstate Printers and Publishers, Danville, Illinois.
13. REPORTING FFA NEWS, Rogers, Interstate Printers and Publishers, Danville, Illinois.
14. ROBERT'S "RULES OF ORDER," Available in most book stores.
15. SO YOU WERE ELECTED, Bailard and McKown, McGraw-Hill Book Company, Inc., New York, New York.
16. SPEAK WITH EASE, R. C. ROSS, National Farm Book Company, Viroqua, Wisconsin.
17. THE FFA AND YOU, Bender, Clark and Taylor, Interstate Printers and Publishers, Danville, Illinois.
18. WHEN YOU PRESIDE, S. S. Sutherland, Interstate Printers and Publishers, Danville, Illinois.
19. WINNING FUTURE FARMERS SPEECHES, Volume I and Volume II, L. S. Judson, Interstate Printers and Publishers, Danville, Illinois.
20. YOUR OPPORTUNITIES IN VOCATIONAL AGRICULTURE, Phipps, Interstate Printers and Pu lishers, Danville, Illinois.
21. PARLIAMENTARY GUIDE FOR FFA, Jarrell D. Gray, Box 717, Commerce, Texas.

Manuals or Magazines:

1. AGRIOPPORTUNITIES, National FFA Center, Alexandria, Virginia 22309.
2. A HANDBOOK FOR CONDUCTING FFA MEETINGS (Preliminary Parliamentary Procedure), K. E. Russell, Interstate Printers and Publishers, Danville, Illinois.
3. BOAC COMMUNITY ACTION PROGRAM BOOKLET, National FFA Center, Alexandria, Virginia 22309.
4. FFA OFFICIAL MANUAL, National FFA Supply Service, Alexandria, Virginia 22309.
5. FFA--THE NATIONAL ORGANIZATION FOR STUDENTS IN AGRIBUSINESS AND NATIONAL RESOURCES, National FFA Supply Service, Alexandria, Virginia 22309.
6. NATIONAL FFA CHAPTER SAFETY AWARD HANDBOOK, National FFA Center, Alexandria, Virginia 22309.
7. HANDBOOK FOR NATIONAL OFFICERS, The National FUTURE FARMER, Alexandria, Virginia 22309.
8. NATIONAL CONVENTION PROCEEDINGS, National Executive Secretary, National FFA Center, Alexandria, Virginia 22309.
9. THE FFA ORGANIZATION, National FFA Supply Service, Alexandria, Virginia 22309.
10. NATIONAL FFA CONTESTS (Bulletin No. 4), Future Farmers of America Foundation, Inc., National FFA Center, Alexandria, Virginia 22309.
11. THE NATIONAL FUTURE FARMER MAGAZINE, Alexandria, Virginia 22309.
12. CHAPTER CHAMPIONS (Ideas for Chapter Action), National FFA Center, Alexandria, Virginia 22309.
13. STUDENT PERFORMANCE OBJECTIVES, National FFA Center, Alexandria, Virginia 22309.
14. WHAT IS FFA TO YOU, National FFA Center, Alexandria, Virginia 22309.
15. THE AGRICULTURAL PROFICIENCY AWARD PROGRAM, Future Farmers of America Foundation, Inc., National FFA Center, Alexandria, Virginia 22309.

Pamphlets or Leaflets:

1. SO YOU WANT TO BE AN OFFICER IN THE FFA, Cornell Misc., Bulletin 40, New York State College of Agriculture, Ithaca, New York.
2. WORK EXPERIENCE ABROAD--PROGRAM INFORMATION, National FFA Center, Alexandria, Virginia 22309.
3. WEA--WHAT OTHERS SAY, National FFA Center, Alexandria, Virginia 22309.

FFA Foundation Booklets:

1. ANNUAL REPORT, Future Farmers of America Foundation, Inc., National FFA Center, Alexandria, Virginia 22309.
2. CONGRATULATIONS BOOKLET, Future Farmers of America Foundation, Inc., National FFA Center, Alexandria, Virginia 22309.
3. SPECIAL PROJECT BOOKLETS IN PROFICIENCY AWARDS, SAFETY and BOAC, Future Farmers of America Foundation, Inc., National FFA Center, Alexandria, Virginia 22309.
4. SPONSOR BOOKLET, Future Farmers of America Foundation, Inc., National FFA Center, Alexandria, Virginia 22309.

APPENDIX

APPENDIX A

SIZE AND FACILITY SPECIFICATIONS:

A. Classroom:

1. 35 to 45 square feet per student in largest class, minimum width of 24 feet, 900 square feet is desirable.
2. Entrance doors at least 3' wide
3. Students have at least 2 1/2' linear table space with tables not wider than 3'
4. Air intake and exhaust
5. Fluorescent lighting, 35-50 foot candles
6. Accoustically treated ceiling
7. Tile floor
8. Window height 5' to 6' above floor
9. A minimum window square footage at 10-15% of floor space
10. Ceiling height 10-14'
11. Chalkboard: 12'-16'
12. Bulletin board: 10'-12'
13. Adjoining laboratory if possible; 12' door to allow equipment to be rolled in classroom is desired.

B. Office:

1. Recommend 200 square feet. If being used as conference room, add additional 100 square feet.
2. Window to classroom and shop
3. Door to outside entrance or to hall leading to outside
4. Door to classroom; third door could be to shop
5. Telephone
6. Lighting, ceiling, floor and ventilation smiliar to classroom

C. Laboratory:

1. 20 square feet per student
2. If room adjacent to classroom, enclose by folding doors; space per student can be reduced to 10 square feet if part of classroom can be used as laboratory space.
3. Lighting, ceiling, floor, and ventilation similar to classroom
4. Laboratory equipment should include acid proof sink and bench top plus cabinet space for storage of equipment and supplies
5. May provide 2-3 study carrols for individualized instructional programs.

D. Locker room:

1. Minimum 300 square feet
2. One small locker per boy or two boys per larger locker
3. Entry from classroom and/or shop
4. At least 1 stool, 1 urinal, and small sink for washing hands

5. Bradley fountain in shop for student use during shop cleanup
6. Lighting and ventilation similar to classroom

E. Classroom storage room:

1. 120 square feet
2. Prefer walk-in storage room rather than built-in cabinets in classroom
3. 3' wide door

F. Shop storage:

1. 300 square feet
2. Minimum length 20 feet
3. Prefer double entry doors for easier stocking and removal of materials
4. Two level storage will better utilize space, minimum 6 feet ceiling height on upper level, provide permanent staircase to upper level.
5. Provide adequate lighting

G. Outside area:

1. Outside storage building or open shed provides adequate yet inexpensive storage area for shop materials.
2. Area should be covered with concrete or crushed rock. If concrete is used, provide crushed rock area for steam cleaning of equipment.
3. Provide drain if slope is such that materials will not drain away from building
4. Area should be fenced or outlined with shrubs
5. Provide unloading dock
6. Outside area should have adequate lighting for unloading after dark and night-time protection of materials and equipment

H. Agricultural mechanics laboratory:

1. 150 square feet per student, minimum 2400 square feet
2. Width to length ratio of 1-1/2 to 2
3. Minimum width of 40 feet
4. Ceiling 14-16 feet high
5. Shop door: 16 feet wide, 14 feet high
6. All service doors at least 3' wide, provide service door near overhead door
7. Windows at least 6' off floor
8. No more than 10% of floor space in windows
9. Fluorescent lighting providing 35-40 foot candles over all work areas
10. Concrete floors, appropriately sealed
11. At least one floor drain
12. Hooded exhaust system in welding area, 2-speed exhaust fan
13. Air intake system

14. Exhaust system for paint area, exhaust pickup should be near floor. Paint area should be separate from main shop; provide explosion proof lighting
15. General exhaust system for other than paint and welding area
16. Suggest wall type benches with roll-away storage units below benches
17. Non-skid paint around all stationary power equipment
18. Avoid placing electrical outlets in the floor - use wall outlets and ceiling drops

APPENDIX B

SUGGESTED VOCATIONAL AGRICULTURE DEPARTMENT EQUIPMENT AND SUPPLIES

				Source
	1	Pliers to apply livestock ear tags	$ 5.00	1
	6	Livestock marking paint sticks	1.80	1
	1	Hog ear notcher	4.65	1
	1	Animal clipper	58.00	1
	1	Livestock hoof trimmer	19.25	1
	1	Hog ringer	1.60	1
	4	Swine backfat probes	1.00	1
	1	Sheep and hog scale	360.00	1
	1	Elastrator	12.50	1
	1	Utility scale	16.20	1
	1 ea.	Dairy cow, beef weight tapes	1.75	1
	1	Egg scale	4.45	1
	1	Metal stencil set, 2"	15.75	1
	1	10cc. livestock syringe	4.65	1
	3	Soil probes	26.55	1
	1	Electric dehorner	21.00	1
	1	Soil testing kit	55.50	1
	1	Soil thermometer	2.00	1
	1	Plant tissue test kit	20.00	1
	1	pH meter	145.00	1
	1	Crop moisture tester	142.00	1
	1	Grain test weight tester	40.00	1
	1	Pruning saw	8.00	1
	2	Pruning shears	9.78	1
	1	Pruning lopping shears	9.00	1
	1	Indoor greenhouse	35.00	1
	1	Land measuring wheel	60.00	1
	1	Hand land level	12.00	1

Texts, References, and Teaching Aids

	1 set	Successful Farming Vo Ag Teaching Kits	75.00	3
		Samples of Soil Textural Classes	8.15	1
		Nebraska Tractor Test Data	.75	4
		Metric Instructional Kit	22.50	4
Booklets	1	Sawhorse Layout w/ the Framing Square	.75	4
	1	Rafter Layout w/ the Framing Square	1.60	4
	1	Quality Concrete	1.60	4
	1	Micrometers, Calipers, Gages	2.00	4
	1	Torque and torque wrenches	2.00	4
	1	Fiberglass hog trough mold	30.00	4
		Crop Judging Kit (SDSU)	16.00	2
Copies	15	JD Engines Text @ 5.60 each	84.00	5
	15	JD Power Trains @ 4.30 each	64.00	5

			Source
15	JD Hydraulics @ 4.30 each	$ 64.50	5
15	JD Electrical Systems @ 5.15 each	77.25	5
1 set of 10	FOS Texts	25.95	5
1	Tractors (FMO) JD	6.95	5
1	Safety (FMO) JD	6.95	5
1	Preventive Maintenance (FMO) JD	6.95	5
1	Combine Harvesting (FMO) JD	6.95	5
1	Tillage (FMO) JD	6.95	5
1	Planting (FMO) JD	6.95	5
1	Hay and Forage Harvesting (FMO) JD	6.95	5
1	Machinery Management (FMO) JD	5.95	5
1	(AAVIM) Planning an Individual Water System	4.35	6
1	(AAVIM) Maintaining the Lighting and Wiring System	2.55	6
1	(AAVIM) Electric Motors	2.10	6
1	(AAVIM) Building Fences	2.55	6
1 ea.	MWPS - Dairy Plan Book	2.00	6
	Beef Plan Book	2.00	6
	Sheep Plan Book	2.00	6
	Swine Plan Book	2.00	6
	Horse Plan Book	2.00	6
	(AAVIM)		
16	Small Engines, Vol. I @ 4.35 each	69.60	6
16	Small Engines, Vol. II @ 5.55 each	88.80	6
1	Farm Utility Buildings	2.40	6
1	Fuels and Lubricants	3.45	6
1	Understanding and Measuring Horsepower	2.55	6
1	Tractor Maintenance	4.05	6
16	Doane Farm Management Guide	87.36	7
1	Do It Right the First Time (farm law)	6.95	7
1	Agricultural Mathematics	4.70	7
1	Essential Aspects of Career Planning and Development	6.95	7
kit 1	Applying for a Job	3.95	7
1	Succeeding on the Job	3.95	7
1	Supervising on the Job	3.95	7
1	Careers in Agribusiness and Industry	6.25	7
1	Exploring Agribusiness	7.25	7
1	Handbook of Agricultural Occupations	7.25	7
1	Student Manual - An Introduction to Agricultural Business and Industry	3.75	7

			Source
1	Teachers Guide - An Introduction to Agricultural Business and Industry	$ 2.50	7
1	Raising Vegetables	6.25	7
1	Our Soils and Their Management	8.25	7
1	Modern Fruit Science	16.50	7
1	The Insect Guide	6.95	7
1	Using Commercial Fertilizers	6.25	7
16	Identification and Judging, Crops - Weeds - Diseases	28.00	7
1	The Stockman's Handbook	13.46	7
1	The FFA and You	6.95	7
1	Robert's Rules of Order	6.75	7
1	Feeds and Feeding	6.50	7

Texts, References, Aids, etc

1	Domestic Rabbit Production	5.50	7
1	Horses and Horsemanship	11.25	7
1	The Complete Dog Book	6.00	7
1	Hardware Identification Kit	7.25	7
1	Tool Identification Kit	6.25	7
1	Meat Identification Kit	7.50	7
16	Mechanics in Agriculture	143.20	7
1	600 More Things to Make for Farm and Home	5.95	7
1	Handbook of Livestock Equipment	7.25	7
16	Wiring Simplified	16.00	7
1	Manual for Sharpening Hand Wood Working Tools	1.00	7
1	The Farm Management Handbook	6.95	7
1	The Marketing of Livestock and Meat	8.25	7
16	Credit Units from Fed. Inter. Credit Bank	Free	8
1	Farm Power and Machinery Management	7.50	9
1	Farm Appraisal and Valuation	11.50	9
1	Better Farm Accounting	.60	9
16	Livestock and Poultry Production, 4th ed.	179.52	10
16	Profitable Soil Management	151.20	10
16	Crop Production	175.20	10
16	Leadership Training and Parliamentary Procedure for FFA	67.68	10
1 set	Ag 1,2,3,4, Vo-Ag Curriculum from Oklahoma	51.00	11
1 set	Ohio - Agriculture Work Experience Units student manuals	3.00	12

Agricultural Supplies Business and Service Related Class Units

			Source
16	Set of 7 student manuals per student	$ 128.00	12
1 set	Teacher guides	4.50	12
1	Office Procedures Used in the Agricultural Services	3.25	12
1	Feeds (Student and Teacher Guides)	3.00	12
1	Ag Chemicals (Student and Teacher Guides)	3.25	12
1	Business Practices for Agricultural Machinery (Student and Teacher Guides) Dealers	4.50	12
1	The Greenhouse Worker	3.50	12
1 ea.	The Nursery Worker; Part I, Part II	4.50	12
1	Conservation Aide	5.35	12
16	Minn. Farm Account Book	53.60	13
1	Metals and Welding	7.50	4

Instructional and Office Equipment

4	Adding machines	320.00	1
1	Filmstrip cabinet	50.00	1

Filmstrips and Slides

Filmstrips

Human Relations in Agribusiness	4.15	1
Salesmanship in Agribusiness	4.15	1
Careers in Farm Services	9.55	1
Careers in Farm Supplies	9.55	1
Tractor Maintenance (8 films)	77.60	1
Calibrating Field Sprayers	4.45	1
Calibrating a Granular Applicator	3.40	1
Electrical Terms -- Their Meaning and Use	18.00	1
How Farm Electrical Motors Start and Run	16.80	1
Learning Arc Welding Skills	6.65	1
Planting Corn	5.15	1
Factors Affecting Classes and Grades of Soybeans	3.45	1
Recognizing Herbicide Injury	4.60	1
Judging Beef Cattle	6.00	1
Let's Make Concrete	2.50	1
Breeds of Dairy Cattle	3.25	1
Fundamentals of Dairy Cattle Judging	6.00	1
Starting to Keep Records	4.55	1
Pruning Orchard Trees	6.00	1
Preventing Transportation Losses of Livestock	3.40	1
Parliamentary Procedure in Action	18.00	1
Steps to a Better Lawn	4.90	1
Applying for a Job	4.35	1

Filmstrips-cont'd		Source
Safe Use of Pesticides on the Farm	5.50	1
Selecting Breeding Sheep	5.05	1
Judging Sheep	6.00	1
Soil Texture	2.25	1
Soil Color	4.00	1
Soil Structure	1.95	1
Breeds of Swine	4.20	1
Swine Carcass Evaluation	7.80	1
Identification of Weeds (Part I & II)	6.90	1
Plan the Livestock System and Estimate Fertility Costs	4.05	15
Factors Affecting Classes and Grades of Wheat	4.25	15
Diseases of Soybeans	4.10	15
Product Competition	4.05	15
Product Knowledge	4.05	15
A Market For Your Product	4.05	15
Displaying Merchandise	4.55	15
Slides		
Power Mechanics 2 and 4 Cycle Engines	10.55	1
Oxy - Acetylene Welding	17.50	1
Identification of Meat Cuts	39.30	1
U.S. Grades for Beef Carcasses	14.50	1
U.S. Swine and Pork Grades	14.50	1
Beef Carcass Judging and Grading	5.40	1
Diseases of Oats	6.00	1
Diseases of Wheat	6.00	1
Diseases of Corn	5.20	1
Culling Poultry	5.70	1
Judging Poultry, live and dressed	28.00	1
Life Cycle of Round Worm of Swine	2.70	1
How to Take a Soil Sample	4.50	14
Fertilizers a Paying Investment	12.15	14
Agriculture and Your Environment	11.00	14
Battery Ignition Systems	26.00	4
Carburetor	24.00	4
Reading the Micrometer	6.00	4
Torque and Torque Wrenches	7.00	4
Truss Rafter Layout	21.00	4
Fertilize Those Soybeans	7.00	16
Alfalfa for Top Profits	8.00	16
Soil and Its Properties	10.50	16
Grand Total	$4129.15	

Additional teaching materials would include agricultural magazines, commercial publications, and college publications.

FOOTNOTES - SOURCES OF TEACHING MATERIALS

[1]Supplies available from Nacso, Ft. Atkinson, Wisconsin, Prices are from 1974-75, catalog #125

[2]Available from Plant Science Department at SDSU, Brookings, South Dakota 57006

[3]Successful Farming Magazine, Des Moines, Iowa, also from source #1

[4]Hobar Publications, 1305 Tiller Lane; St. Paul, Minnesota 55112

[5]Deere and Company, Distribution Service Center - Department S/P
1400 3rd Avenue, Moline, Illinois 61265

[6]Ag Engineering Department, SDSU, Brookings, South Dakota 57006

[7]Interstate Printers and Publishers, Inc., Danville, Illinois

[8]Farm Credit Banks of Omaha
Box 1229
Omaha, Nebraska 68101

[9]Iowa State University Press, Ames, Iowa 50010

[10]Prentice-Hall, Englewood Cliffs, New Jersey 07632

[11]State Department of Voc. and Tech. Ed., Curriculum and Instructional Materials Center, 1515 West Sixth Avenue, Stillwater, Oklahoma 74074

[12]Ohio Agricultural Education, Curriculum Materials Service, Room 254, 2120 Fyffe Road, Columbus, Ohio 43210

[13]Minnesota Vocational Materials Center
Staple Area Vo-Tech Institute
Staples, Minnesota 56479

[14]The Fertilizer Institute, 1015 18th Street, N.W., Washington, D.C. 20036

[15]Vocational Agriculture Service, 434 Mumford Hall, Urbana, Illinois 61801

[16]Potash Institute of North America, 1649 Tillie Circle, N.E., Atlanta, Georgia 30329

Vocational Agriculture Ag Mechanics Equipment

1	95#, blacksmith anvil	$ 142.00
1	handy anvil (for sickle repair)	3.98
1	3' ripping bar	3.93
1	2' ripping bar	2.93
2	sliding T bevels @ $3.65	7.30
1	strap type battery carrier	.85
1	set of 13 wood auger bits	23.65
2	countersink, (1/2" and 3/4")	4.55
1	set of 29 high speed twist drills	36.55
1	expansive bit	6.85
1	offset screwdriver	.85
12	assorted phillips and standard screwdrivers	25.00
2	braces, 10" sweep	12.50
1	wire wheel brush	20.00
1	safety gasoline can (5 gal.)	12.40
3	oil cans, Squirt	7.50
8	assorted cold chisels	10.96
6	"C" clamps	28.75
1	Bolt Cutter 9/16" cap.	31.35
1	glass cutter	1.12
1	pipe cutter	27.70
1	post hole digger	7.80
2	wing dividers	10.80
1	wheel dresser	2.33
2	Hand drills (¼" cap.)	12.50
1	½" HD Elec. Drill	100.00
2	Concrete workers edgers	4.50
1	screw extractor set	5.00
1	flaring tool	6.15
2	elec. bench grinder (6")	180.00
1	concrete worker's wood float	.90
1	Groover, Concrete workers	2.50
1	3/8" hand groover, sheet metal	3.93

The Ag Mechanics Equipment prices used are from the 1974-75 Catalog of Midwest Shop Supplies; Sioux City, Iowa.

South Dakota State Surplus in Huron may be able to supply some of these and other items.

1	grease gun	$ 5.45	
2	ball peen hammers; 1#, 2#	7.70	
12	claw hammers, 16 oz.	72.00	
1	8# sledge hammer	10.75	
1	Hatchet	10.89	
8	arc welding helmets	86.00	
1	"A" frame gantry, 2 ton cap. min.	350.00	
1	Trolley for gantry	63.00	
1	chain hoist, 2 ton cap.	337.00	
1	speed indicator	8.50	
1	hydraulic jack, 5 ton cap.	30.90	
2	draw knives, 14"	28.30	
4	putty knives	4.00	
2	trouble lamps	4.40	
2	carpenter's levels	16.60	
1	end cutting nippers	4.00	
2	mallets	6.00	
2	oil stone, combination	5.60	
1	block plane - 6"	6.70	
4	Jack planes - 14"	47.20	
1	jointer plane - 22"	22.35	
1	screw plate set	92.00	
6	pliers, comb. side cutting	9.30	
1	lineman's pliers	4.60	
2	longnose pliers	6.00	
1	plumb bob - chalk line	2.22	
1	gear puller, HD	18.35	
1	gear puller, small	9.35	
2	lining up punch	7.00	
2	Center punch	2.25	
1	leather punch	3.40	
4	pin punch	3.40	
2	solid punch	3.00	
1	reamer, pipe	3.55	
1	Rivet buster	3.30	
1	2' steel rule	5.65	
6	steel tapes (12')	30.00	
1	belt sander	125.00	
1	finishing sander	75.00	
1	sander-polisher	70.00	
1	bayonet saw	50.00	
1	Port. 7¼" Skil-saw	92.00	
1	Table saw, 10"	508.00	(Prices vary
1	Radial arm saw, 12"	400.00	widely)
1	miter box and saw	90.00	
1	compass saw, 12"	2.14	
1	metal cutting bandsaw	568.00	
4	crosscut saws, 8 and 10 point, 26"	20.60	
2	hacksaws	7.70	
1	keyhole saw	1.97	
2	rip saws (5 and 6 point) 26"	20.60	
2	carbon scrapers	1.92	
4	nail sets	2.30	

2	rivet sets	$ 7.00
1	saw set	8.55
1	round point shovel	6.55
1	shop vacuum	78.00
1	round point shovel	6.35
1	spade	6.20
2	tin snips	13.00
2	Elec. soldering guns	25.80
2	spoke shaves	6.50
1	combination square	4.00
10	carpenter's square	61.50
2	try squares	6.00
1	100' steel tape	12.75
2	Forge tongs	26.00
4	oxy-acetylene welding outfits w/cutting torches	672.00
4	vises, machinists	260.00
1	drill press, floor model	340.00
1	drill press, vise	23.00
1	pipe vise	44.00
4	wood working vises	134.48
4	arc welders, w/carbon arc torches (may need more welding machines)	520.00
1	wire stretcher	10.30
6	adjustable wrenches, 8", 10", 12", 18"	35.00
1	set, box wrenches	14.20
2	set, box open end wrenches	63.20
1	set ingition wrenches	12.55
3	pipe wrenches	33.65
1	socket set, 32 pieces (¼", ½" drive)	56.00
1	allen wrench set	2.58
1	vise grip chain wrench	5.80
2	vise grips	5.00
1	socket set, 3/8" drive, 19 pieces	28.00
1	battery cell tester	14.00
2	cotter pin puller	4.30
2	auto creepers	29.00
1	air compressor (2 stage, 3 HP)	1150.00
1	timing light	22.00
1	torque wrench	40.00
1	AC ohmmeter	5.10
1	AC voltmeter	5.50
2	propane torch kits	22.00
1	feeler gauge	1.98
1	spark plug gap gauge	.53
1	universal nut cracker	7.97
1	tire wrench	4.37
1	glaze breaker	15.00
1	ridge reamer	16.67
4	ring compressors	10.72
5	Valve spring compressor	24.82
1	spray gun, paint etc.	46.00
1	micrometer set	86.00

1	set telescoping gauges	$ 33.75
1	tubing cutter	5.00
1	adj. slip joint pliers, 16"	6.47
4	diagonal pliers	19.48
1	assorted wood chisels, set	32.35
2	3/8" electric drill	85.00
1	HD hand stapler	15.00
4	bar clamps	42.60
1	elec. circuit tester	1.07
1	HD, 12" floor grinder	438.00
1	conduit bender	31.00
4	misc. chipping hammers	23.56
1	4 piece set of masonry bits	5.00
1	set, 7 piece wood boring bits	5.00
4	bench brushes	7.20
4	floor brushes	28.00
6	paint brushes	12.00
8	assorted files	16.00
1	first-aid kit	10.00

Miscellaneous

welding rods
glue, sandpaper and operating supplies
wire, automatic controls and switches for electrical instruction
surveyor's transit
battery charger
metal shears; metal bender
cam dwell meter
welding booth - benches (student made)
storage cabinets

1	forge furnace	$ 573.00
1	tire pressure tester	4.50
1	high pressure sprayer-washer	500.00
1	compression tester	3.55
1	piston groove cleaner	2.21
1	elec. demo. panel	250.00
20	pair safety glasses	26.00
1	safety glass sanitizor cabinet	130.90
4	B&S gas engines, 3 hp.	240.00
	Grand Total	$10,719.28

APPENDIX C

EXAMPLES OF SUGGESTED PROGRAM EVALUATION INSTRUMENTS

A. National Chapter Award Program - Chapter Guide to FFA Activities

B. Vocational Agriculture Department Evaluation (State Supervisor form), Division of Vocational Education, Pierre, South Dakota.

C. A Partial Guide For Constructing a Student Follow-up Instrument, Appendix C, Locally Directed Evaluation of Local Vocational Education Program, available from Department of Secondary Education and Curriculum, College of Education, Michigan State University, East Lansing, Michigan.

D. Guidelines for Evaluation of Local Programs of Vocational Agriculture, available from Agricultural Education, South Dakota State University, Brbookings, South Dakota.

APPENDIX D

A sample four year program in Vocational Agriculture by major units and approximate time schedules.

	Ag. I	Hours	Ag. II.	Hours	Ag. III	Hours	Ag. IV	Hours
First	Orientation	5	Orientation	2	FFA	5	FFA	5
Nine	FFA	10	FFA	5	Soil and Water Management	40	Ag. Marketing	25
Weeks	Weed Identification and Control	20	Animal Nutrition	10			Farm Law	15
	Small Grain Production	30	Beef Production	30			Insurance	10
Second	Corn Production	30	Dairy Production	30	Farm Electricity	45	Farm Records and Income Tax	20
Nine			Sheep Production	10			Adv. Welding	20
Weeks							Ag. Construction	40
Third	Forages	20	Hog Production	10	Advanced Feeding	10		
Nine	Crop Judging	5	Supervised Ag. Occupations	10	Supervised Ag. Occupations	10	Supervised Ag. Occupations	10
Weeks	Supervised Ag. Occupations	10	Shop Safety and Orientation	3	Seed Certification	2		
	Ag. Mechanics Orientation	2	Arc Welding	15	Land Measurement	8		
	Tools	3	Oxyacetylene	15				
Fourth	Construction (wood)	20	Metals	15	Farm Power	45	Ag. Machinery and Hydraulics	30
Nine	Safe Tractor Driving Course	20	Tool Reconditioning	15				
Weeks	Final Review and Test	5	Final Review and Test	5	Final Review and Test	5	Final Review and Test	5

APPENDIX E

A sample four year program in Vocational Agriculture by major units and approximate time schedule.

FIRST SEMESTER

Week	Freshmen Ag. I	Sophomores Ag. II	Juniors Ag. III	Seniors Ag. IV
1.	FFA-History and organization	FFA-Program of work	FFA-Committee assignments	FFA-Degrees and officer training
2.	Introduction to Parliamentary Procedure	Parliamentary Procedure	Parliamentary Procedure	Parliamentary Procedure
3.	Weed Identification	Livestock Feeds and Feeding	Land Judging Unit	Land Judging Unit
4.	Weed Identification	Feeds Unit	Land Judging Unit	Land Judging Unit
5.	Weed Control	Feeds Unit	Acquiring the Farm	Shop Safety Advanced Arc Welding Unit
6.	Shop Safety Intro. to Shop & Tool Identification	Swine Production	Planning the Farm Business	Advanced Arc Welding Unit
7.	Shop-Construct Wood working Joints	Swine Production	Shop Safety Individual Shop Projects	Oxy-acetylene Welding
8.	Construct Nailbox or Sawhorse	Swine Production	Individual Shop Projects	Oxy-acetylene welding
9.	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests
10.	Nature and Importance of Plants	Introduction to Arc Welding	Shop-Work on Individual Shop Projects	Advanced Bills of Materials Problem

Week	Freshmen Ag. I	Sophomores Ag. II	Juniors Ag. III	Seniors Ag. IV
11.	Growth and Reproduction of Plants	Introduction to Oxy-acetylene Welding	Individual Shop Projects	Building Materials Unit
12.	Corn Production Unit	Beef Cattle Production	Farm Records	Rafter Cutting Using the Square
13.	Corn Production Unit	Beef Cattle Production Cont'd.	Taxes, Insurance & Social Security	Adv. Principles of Carpentry
14.	Small Grain Unit	Beef Cattle Production Cont'd.	Financing the Farm Business	Individual Shop Projects
15.	Small Grain Unit	Principles of Animal Breeding	Contracts in Agriculture	Individual Shop Projects
16.	Wood Identification	Principles of Animal Breeding	Management in Crop Production	Individual Shop Projects
17.	Bills of Materials Demonstrations on Machine Use	Livestock Judging	Farm Law	Individual Shop Projects
18.	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests
		SECOND SEMESTER		
19.	FFA Speech Work	Shop Safety Individual Projects	Shop-Individual Projects	Farm Engine Unit
20.	Introduction to Soils	Shop-Individual Projects	Shop-Individual Projects	Farm Engine Unit
21.	Soils Unit	Shop-Individual Projects	Shop-Individual Projects	Farm Engine Unit

Week	Freshmen Ag. I	Sophomores Ag. II	Juniors Ag. III	Seniors Ag. IV.
22.	Soils Unit Fertilizers	FFA Speech Work	Management of Soils and Fertilizers	Paints and Painting
23.	Soil Testing & Sampling	FFA Speech Work	Management of Livestock Production	Cold Metal Unit
24.	Shop-Individual Projects	Dairy Production	Management of Livestock Production	Shop-Individual Projects
25.	Shop-Individual Projects	Dairy Production	Management of Dairy Production	Shop-Individual Projects
26.	Shop-Individual Projects	Dairy Production	Management of Dairy Production	Shop-Individual Projects
27.	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests
28.	Shop-Individual Projects	Shop-Individual Projects	Shop-Individual Projects	Hardware & Lumber Ident.
29.	Shop-Individual Projects	Shop-Individual Projects	Shop-Individual Projects	Elective
30.	Shop-Individual Projects	Sheep Production	Shop-Individual Projects	Elective
31.	Crop Judging	Sheep Production	Ag. Chemicals	Electricity Unit
32.	Crops Soybeans & Flax	Elective	Machinery Selection	Electricity Unit
33.	Legumes Alfalfa & Sweetclover	Meats Judging	Building Selection	Electricity Unit

Week	Freshmen Ag. I	Sophomores Ag. II	Juniors Ag. III	Seniors Ag. IV.
34.	Red Clover, White Clover, Pastures	Poultry Production	Marketing	Farm Machinery Unit
35.	Annual, Biennial & Perennial Forage Grasses	Poultry Production	Elective	Farm Machinery Unit
36.	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests

APPENDIX F

A sample four year program in Vocational Agriculture operating on a quarter course system in a two-man department.

Nine Week Periods

Daily Class Period	1st	2nd	3rd	4th
1.	Ag. Mech II (Project Construction) 11th Grade	Farm Building 11th Grade	Livestock and Meat Evaluation 11th Grade	Electricity (Residential and Rural) 11th Grade
2.	Soil Science 10th Grade	Small Engines 10th Grade	Crops II 10th Grade	Beef Production 10th Grade
3.	Range and Pasture Management 12th Grade	Farm Power 12th Grade	Farm and Range Management 12th Grade	Livestock Improvement 12th Grade
4.	Swine Production 10th Grade	Sheep Production 10th Grade	General Horticulture 10th or 11th Grade	
5.	Introduction to Animal Science 9th, 10th, 11th, or 12th Grade	Small Engines 10th, 11th, or 12th Grade	Horse Production 11th or 12th Grade	Irrigation Systems 11th or 12th Grade
6.	Introduction ____ to ____	Introduction ____ to ____	Introduction ____ to ____	Introduction ____ to ____
7.	Vocational Agriculture 9th Grade	Animal Science 9th Grade	Crop Production 9th Grade	Ag. Mechanics 9th Grade